CONTROL OF VENEREAL DISEASES
AN EPIDEMIOLOGICAL APPROACH*

JOHN E. GORDON, MD, FRCP, COLONEL MC, USA

Division of Preventive Medicine, Office of the Chief Surgeon, ETO, United States Army

IT is a military dictum that the most effective force must be concentrated where the greatest progress can be attained within the shortest time. It is an epidemiological principle that successful control of a communicable disease depends on recognition and elimination of the sources of infection. The venereal diseases have been too much set apart from other acute communicable processes; too much consideration has been given to their moral aspects to the neglect of the social and economic; and attention has been focused on the infected individual rather than the afflicted community—on the illness of Mary Jones instead of the venereal disease of London. I shall choose to look upon the venereal diseases as communicable diseases, to consider them as one would measles, scarlet fever or pneumonia, and to integrate what is known of them—what is practised in their control and prevention—with the accepted epidemiological principles which govern the control of all communicable diseases.

The first requirement of the epidemiological method is an adequate knowledge of cause. The causes of communicable diseases are of two kinds—the active infectious agent, and the predisposing factors. In respect of the venereal diseases we are well informed about the infectious agents—the gonococcus in gonorrhœa, *Treponema pallidum* in syphilis, and specific bacteria or viruses in the less common of the group. The principal lack of information in respect of cause is not in the field of microbiology but in those factors which predispose to infection, those host factors which depend on psychological, physiological, sociological and economic influences. Generalities have been drawn, theories have been elaborated and speculations are common, but far too little in evidence are the precise statistical facts on which to base constructive measures. There is need for field study by epidemiological methods. The study of disease in its natural environment brings out facts which cannot be heard through a stethoscope nor drawn from a test-tube. This sort of knowledge is as important to improved control of the venereal diseases as was knowledge about the louse in the limitation of typhus fever.

CLINICAL DIAGNOSIS

Having knowledge of the communicable nature of a disease and of the agent which causes it, the next feature of the epidemiological approach is to establish criteria for its recognition in its natural environment. In contrast to many other communicable diseases, the technical methods for recognising the two important venereal diseases are simple and readily available. Furthermore, the venereal diseases are spread in only one way—by direct (usually sexual) contact, which is in general widely spaced and readily remembered, in contrast to the repeated and ephemeral exposures which characterise diseases contracted through the upper respiratory tract. This adds greatly to the value of a carefully taken history. In the male particularly the clinical symptoms and the physical signs of gonorrhœa are well-defined. For many years, and principally because of local requirements and moral implications, diagnosis of this disease has required demonstration of the causative agent by laboratory means. From a purely professional standpoint this is unnecessary and gonorrhœa can be diagnosed on the basis of history, clinical symptoms and physical signs. The United States Army in the European theatre of operations has recognised this principle by prescribing that demonstration of the organism, while desirable, is not essential for the diagnosis of gonorrhœa, and contrariwise a diagnosis other than gonorrhœa (non-specific urethritis and similar terms) is not permitted in patients with an urethral discharge until gonorrhœa has been convincingly excluded. The error introduced by the application of these admittedly rigid criteria represents less than a fraction of that in the other direction through the present common practice of evading a diagnosis of gonorrhœa when possible.

On the other hand, laboratory confirmation of the diagnosis of syphilis is essential, but when properly used the available methods are simple, efficient and reliable. In the presence of typical clinical manifestations, a diagnosis of syphilis may be made on the basis of positive reactions to standard serological tests or by demonstration of motile *T. pallidum* from appropriate lesions. The occurrence of spirochætes other than *T. pallidum* on the surface of oral and anal lesions renders material from these sources unreliable. In the absence of typical clinical manifestations a diagnosis of syphilis must not be made on the basis of serological tests in the presence of fever, in patients recently vaccinated against smallpox, or in those with or suspected to have various infectious diseases such as malaria, infectious mononucleosis, lymphogranuloma venereum, or other conditions recognised or suspected to produce false positive reactions. Furthermore, a diagnosis of syphilis must not be made in the absence of clinical manifestations until a positive serological test has been confirmed and found to remain persistently positive at intervals of two to four weeks over a minimum period of three months. Tests of the "presumptive" or "exclusion" variety should not be used in the diagnosis of syphilis.

The less common venereal diseases—chancroid, lymphogranuloma venereum and granuloma inguinale—are equally well-defined clinical entities, and adequate criteria for their diagnosis are available.

DETECTION OF FOCI OF INFECTION

The primary practical application of the epidemiological method lies in the recognition of existing foci of infection from which new infections may originate. For many diseases foci of infection are multiple in kind, widely distributed and often difficult to identify. In contrast the human host is the sole reservoir for the venereal diseases; none exists in nature. The problem is thereby simplified and becomes merely a matter of identifying human beings suffering from these diseases. A variety of field methods are available, of varying applicability, largely governed by the nature of the disease under consideration. That of individual case-finding is the most productive and in general the most readily accomplished.

Case-finding by contact investigation.—This standard epidemiological procedure as applied to the venereal diseases involves five separate procedures. The start is made with the properly confirmed diagnosis of a venereal disease in any patient. A history of all recent sexual contacts is obtained from the patient. This roster of contacts serves to determine all possible links in the continued chain of infection—not only from whom the patient may have acquired his infection but also to whom he may have transmitted it. It permits working both backward and forward from the established case.

The next procedure is to visit each contact to tell him that he may have a venereal infection and needs a medical examination. Any implication of accusation must be avoided. The method of approach should reflect solely a desire to be helpful; it must be that of the professional health worker interested in curbing the spread of disease and not that of the moralist or the law-enforcement officer. The technique is personal public-health education at its best. The aim is to bring the person to proper facilities for examination and for treatment if necessary. The necessary medical care may be secured through reference to a private physician or to a clinic, at the patient's choice. Something more than advice is usually necessary, and the good contact worker will not only recommend the patient to consult medical facilities but will also help in the often difficult situation of registration and explanation of the reasons for the visit.

The final feature of case-finding is to make sure that if venereal disease be found treatment is followed to completion. This is known as case-holding. Lapse in treatment is common among patients with venereal disease and repeated follow-up visits are often necessary.

The principal accomplishment of this method of case-finding is the removal of a focus of infection from the community. Among measures which contribute to the decrease of the venereal diseases none is more important.

* Read before the Medical Society for the Study of Venereal Diseases, London, Feb. 26, 1944.

In addition the individual concerned has benefited from the recognition and elimination of his infection, and the epidemiological facts arising from accumulated case-studies form the basis for improved methods of administrative control.

The technique is by no means complicated; but much depends on the proper selection of investigators. Experience has led to the belief that the public-health nurse is best qualified. It is obviously impracticable to employ trained epidemiologists, but the nurse, because of the nature of the problem, should have public-health training. She has an approach better suited to female contacts than has a male investigator and is under no disadvantage when the person is a man. Most important of all, she can bring to the task ample time, a personal interest, and a broad social outlook, any or all of which the busy physician may lack. In respect to case-holding—the investigation of defaulters in treatment—some hold the opinion that a trained social worker has an advantage over the public-health nurse. On the other hand, experience shows that the person responsible for bringing a case under treatment has established a personal relationship which is lost when a second worker takes over case-holding.

Contact investigation is distinctly a public-health procedure, to be administered by a public-health authority. By choice, however, the case-finding team should have its headquarters within and be a part of the clinic where patients are treated. This is particularly true if case-holding and case-finding are a combined responsibility.

The effectiveness of case-finding is demonstrated by the experience of United States Army nurses assigned to case-finding work in the venereal diseases in the United Kingdom this past year. The patients were all American soldiers. None of the contacts were Americans. Anonymity was lost to the investigators through the necessity of being always in uniform. There was the added difficulty that in their approach to the contacts they were foreigners and so suspect, and also to a degree unfamiliar with social habits and customs and the intimate understanding of a people which can be so helpful. Nevertheless their results obtained have been good. In all, some 1718 soldiers with a venereal disease have been interviewed. Again because the patients were in a foreign country and many of the contacts were transitory, it was not always possible to obtain identifying information. However, sufficient information to attempt identification was obtained for 782, or about 46% of the sexual contacts involved. Completely identifying information was rare. Sometimes only the first name was known, sometimes there was only a description of the person and the fact that a certain public house was frequented. With such pieces of information it was possible to locate 457 contacts or 58% of those actually sought. The success of the method is shown in the fact that 223 of these girls were registered in clinics by the nurse, 109 were referred to clinics for treatment, and 17 were registered with or referred to private physicians. Thus a total of 349 or 76% were acquainted with the potential dangers they were experiencing and given the advantage of treatment. In addition 61 contacts were already under observation at clinics when found; 10 were under the care of private physicians and 18 were in jail or other institutions; a total of 89. Only 19 contacts (4%) proved uncoöperative. It is to be noted that under existing public-health procedures, and with the benefit of the broad education in venereal disease now practised, less than a sixth (71, excluding the 18 in institutions) of this relatively large group had sought medical care, and only a fifth were receiving it by any means; and yet the vast majority of the remainder were willing to do so when the need was explained. The necessity of contact investigation would seem to be surely demonstrated and the results show how direct and efficient it can be.

Quarantine of known contacts is a time-honoured procedure in the control of communicable diseases. Having knowledge of the exposure of a person to a disease, his movements can be restricted and he can be observed for early evidence of developing infection. With such diseases as smallpox, and others, this is an essential and productive method for early recognition of new cases and for limiting the spread of infection. It is not generally applicable to the venereal diseases. When applied, it usually is voluntary through education in the risks of infection and involves early report to a physician for examination. Under certain circumstances however the use of enforced quarantine does have practical application. In a number of American cities known contacts to venereal disease can, if it is deemed necessary, be kept in quarantine until freedom from infection is established. This is a practical method of dealing with the infectious prostitute.

House-to-house canvass is an effective way of determining the incidence and prevalence of a sudden explosive outbreak of disease, of which food-poisoning is an excellent example. It has no place in the routine attack on the venereal diseases, but in a modified form is frequently used in selected groups. The serological survey (for syphilis) of groups of persons is nothing more nor less than a special application of the technique of house-to-house canvass. It may be applied to the inmates of institutions, to various industrial groups and as a prerequisite to marriage. Its commonest application in recent years is in the routine testing of all patients admitted to hospital. This increasing practice is productive of greater returns than the examination of a like number of healthy people, because patients admitted to hospital are ill, and the illness may be syphilis. Aside from this last application, the serological survey of groups of people conforms to the general rule in being expensive and time-consuming, out of all proportion to the results achieved. One especially glaring illustration is the practice, fortunately becoming outmoded, of routine serological testing of food-handlers. Rarely if ever are the venereal diseases transmitted through the usual occupation of these workers.

Periodical physical examination is another recognised method for identifying foci of infection, best exemplified in tuberculosis practice where members of families in which the disease has occurred are examined at intervals to detect further new cases in incipiency. In addition, periodical general health examinations are increasingly emphasised as fundamental to good preventive medicine practice. A serological test for syphilis, and inquiry for a history suggesting gonorrhœa, should be a part of any examination of this type, or of any general medical examination for whatever cause.

A special case is to be made for including serological tests for syphilis in the routine prenatal care to which every pregnant woman is entitled. It has become general practice in most civilised countries to examine the blood of expectant mothers for syphilis early in gestation and to repeat the examination at least once before delivery. As a measure for reducing congenital syphilis this practice is to be wholly recommended. It might well be required by law.

Notification by physicians to health agencies is a recognised part of the control programme of most communicable diseases. It is the point of departure for the epidemiological method and fundamental to a well-organised case-finding programme. There is no scientific reason why the venereal diseases, since they are communicable diseases, should not be treated as are the others. Lack of a system of reporting is largely dependent on the peculiar features involved in transmission, on moral taboos, and on the presumed rights of the individual. This last concept disregards the obvious fact that the sum of the rights of the individuals who make up the community transcend the privileges of any one of the group, and demand the elimination of venereal disease as they warrant protection against other health hazards.

Some form of notification is a legal requirement of the public-health programme of almost all countries. The usual practice is a confidential report, the patient's name becoming known only when his own antisocial act brings that about, usually through refusal of treatment for the protection of others. Ordinarily no communicable disease is completely reported—some are reported better than others—but if the venereal diseases could be notified at a level of frequency even corresponding to that of whooping-cough, the possibility of eradicating foci of infection would be greatly enhanced. In the United States Army the venereal diseases are reported as a matter of course in the same way as are other communicable diseases, thus permitting distribution of

effort in dealing with the problem according to need. This is in contrast to civilian practice in Great Britain where effort to control the spread of the venereal diseases is dependent on such information as is obtained through voluntary reporting by an infected person.

DISTRIBUTIONS OF THE VENEREAL DISEASES

A tendency towards grouping of cases is a recognised characteristic of a communicable disease. The size of these aggregates, the rapidity with which they develop and their distribution may depend on one of a number of factors, more commonly on a combination of several. Particular and varying distributions in respect of time, of space, of individual and herd capacity to resist infection, of psychological differences and of social and economic relationships, can be identified and evaluated.

Adequate case-finding has been stressed as the first step in the epidemiological method. The individual profits from this; the community also to the extent that accumulated experience is periodically subjected to analysis in order to determine the nature, extent and significance of these aggregations or distributions of disease. The venereal diseases have such distributions. They are less well defined than are those of most communicable diseases, largely because of the attitude which has so long set them apart from other infectious processes. The application of accepted epidemiological methods would bring into play the full force of a programme of control based on orderly directed scientific attack in place of the present approach, which, while many times energetically pursued, gives no assurance that efforts are directed to the maximum benefit.

Geographical distribution.—Some communicable diseases—yellow fever for example—are limited in their geographical distribution to restricted endemic areas. Others of more universal distribution show well-marked variations from place to place. Before the war Sweden had the lowest rate for syphilis of any civilised country. The incidence of syphilis in Italy and in France was recognisably high, although definite data were lacking. A close approximation about the frequency of syphilis in the United States can be made on the basis of routine reporting and large-scale sampling of its efficiency. The information in Great Britain is fragmentary and indefinite since it is based only on infected persons reporting voluntarily to clinics. At any rate there are certain countries in which the venereal diseases are decidedly more of a problem than in others. The same situation holds within countries. In the United States one southern city has over a period of years maintained an incidence of syphilis more than twice as great as that in any other city of like size. Similar examples can be cited in Great Britain—a city in Lancashire of about 120,000 population provides as many fresh infections with syphilis to the United States Army as do the much larger urban communities of Birmingham and Liverpool. Similar differences become apparent when the incidence of syphilis is studied within cities. Comparing two Negro districts of similar size in a large seaport in the United States, the incidence of syphilis is significantly greater among the population of one than the other.

Shifting populations.—That important differences exist in different parts of a fixed population is not always completely appreciated, but the tendency of moving populations to have a greater incidence of communicable disease generally and of the venereal diseases particularly is more widely known. Epidemiologists have thus come to anticipate an increased frequency of these conditions among refugees and immigrants, in those concerned with military activities, especially in wartime, and among those who travel in the pursuit of their occupations. The need for special measures of venereal-disease control for these groups is evident. Where the mass movements are of soldiers under full military control it is relatively easy to develop methods which effectively prevent them from becoming vectors for the transmission of a venereal disease. With civilian populations, sailors and migrant labourers the problem is much more difficult.

Racial differences may be material. Coloured populations of the United States commonly have a frequency of new infections with a venereal disease five times that of white populations. This is more than the effect of local environment, for when coloured troops are transferred to a foreign country the difference is still maintained.

Clinical ratios.—It is common practice to speak of "the venereal diseases" as a group, since epidemiologically they are assumed to have so much in common. Nevertheless, full appreciation of the problem requires not only frequent examination of populations for total incidence, but also for the relative distribution of the several diseases. Ordinarily gonorrhœa is about five times as common as syphilis, the incidence of chancroid being negligible. Under certain conditions however these ratios become altered, so that in some communities of the United Kingdom the relative proportion of syphilis and gonorrhœa becomes as great as 1 : 1 instead of 1 : 5. In the armies of other theatres of war chancroid has changed from an unimportant consideration to a condition accounting for half or more of all venereal infections.

Industrial groups.—Some occupations are associated with high rates for venereal diseases. The most apparent are those which involve wide contact and much travel, with none perhaps more outstanding than that of sailors.

Time variations.—Long-term variations definitely occur over the course of years, related in general to major sociological and economic changes. Whether or not seasonal variations of any magnitude occur is not well known. The essential need is for simple determination of incidence to discover trends in the venereal disease experience of a given community.

Recognition of epidemics.—Centuries have passed since the venereal diseases, and particularly syphilis, appeared in outspoken epidemics, but it is too little appreciated that even in these times actual epidemics do occur. A village in East Anglia had been free from syphilis for a long time. In that locality six soldiers and a group of girls had had indiscriminate sexual relations with no untoward results. Then one of the soldiers visited London, contracted syphilis from a prostitute and returning to the village was ultimately responsible for three girls and at least five additional men developing the disease.

METHODS OF CONTROL

Three general principles guide the epidemiologist in the attack on a communicable disease. Where feasible the most satisfactory method is the destruction or elimination of the reservoirs of infection. The second general method is to break the chain of infection at the point of transfer. Theoretically this action can be developed either against the infectious agent itself or against the vector of that agent—for example, against the mosquito in malaria. Finally, measures may be directed towards increasing the resistance of the individual and thereby the resistance of the herd. The choice of which to employ, or what portion of effort to devote to each, must be based on an analysis of the epidemiological features of the disease concerned.

Attack on reservoirs of infection.—Application of this principle so far as it concerns the venereal diseases is simple. The only reservoir of infection is man and the method is treatment of existing infection. Because of progress in improving methods of treatment, persons with gonorrhœa or syphilis can be promptly rendered non-infectious. The provision of adequate treatment facilities is an integral part of a control programme, and the developing tendency to incorporate treatment facilities within the clinics of general hospitals is to be endorsed, as contributing to higher medical standards and toward bringing these diseases within the full scope of good medical care. Treatment, however, must not be stressed to the neglect of preventive measures.

The second general method for eliminating reservoirs of infection is a full-scale effort toward the repression of prostitution. No better instance of the necessity for focal attack based on variations in likelihood of infection could be brought out. An analysis of the sources of all venereal infections would show that perhaps four-fifths arise from contacts who are not prostitutes. However, if the basis for calculation be the likelihood of contracting a venereal disease from a given number of sexual exposures, the risk of infection from intercourse with a prostitute is many times that of the risk from the much maligned "enthusiastic amateur." There are three

simple reasons why this is true; first, because almost every prostitute has or sooner or later contracts one or more of the venereal diseases; second, because the number of her exposures is so many times greater than the girl of limited activities, and finally, much uninformed opinion to the contrary, the prostitute does not "know how to take care of herself." The epidemiological method with which this discussion is concerned ends its application with the discovery of the prostitute. The necessary treatment to eliminate infection and the improved social and legal effort to limit her activities is not within the province of this discussion. Its importance must not be minimised.

Interrupting the spread of the virus.—Of the three general methods for the control of a communicable disease, those directed toward interrupting the spread of the infectious agent are, with few exceptions, most promising. The technical methods vary with the disease concerned, but fall into general groups. The first includes those measures which must be applied by the individual, while the second group are more general and by their nature are the responsibility of the community. The methods of individual personal hygiene or preventive medicine are thus distinguished from those of public health.

Personal prophylaxis.—The only absolute personal preventive measure is continence. But it is not commonly recognised that through education of the individual about sources of infection this same principle can be applied relatively as well as absolutely. There are certain available sexual partners who present a much greater risk of venereal infection than do others. If sexual contact cannot or will not be eliminated by the individual, it is still within his power to exercise selective discrimination; to limit his contacts to sources of lesser hazard. The problem of promiscuity in contradistinction to selected extramarital sexual relations is in point. The danger of the cheap prostitute is to be emphasised in contradistinction to the partner who is only occasionally exposed.

Actual specific prevention is available under chosen conditions and finds its most ready application in military practice. The specific preventive agents are mechanical, chemical and chemotherapeutic. Mechanical protection, in the form of a properly used condom, is highly efficient. Chemical methods of local disinfection have long been used, especially by armies in stations or centres set up for the purpose. Effective materials have more recently been developed for individual use, some of which are still in the experimental stage. In the future these individual methods may have some application in the civilian population, granted that the level of education in their proper use can be brought to that attained under military conditions.

Chemotherapeutic prophylaxis is at the moment in its infancy, and is limited to the use of a sulphonamide compound by mouth for the prevention of gonorrhœa and chancroid. With the rapid development of new therapeutic agents of both chemical and biological origin, the potentialities in this field are decidedly encouraging.

Public-health measures.—Most public-health programmes for the control of the venereal diseases combine treatment facilities for the infected with a preventive programme. As emphasis on prevention increases, administrative organisation must undergo the same change that has occurred in other fields of medical practice, where prevention has attained equal importance with treatment. With the acute communicable diseases, with tuberculosis, with cancer, the course of development has conformed to a pattern. The care of the ill was the first responsibility recognised by the community. As medicine progressed, the simple preventive measure of isolation of acute communicable diseases in a fever hospital was elaborated to include other measures for the protection of the community. Prevention outgrew the bounds of the fever hospital, the tuberculosis sanatorium or the surgical ward and was accepted as a general responsibility of the community and therefore to be administered by the public-health authority. It seems logical that this must be the eventual future of the venereal diseases. Indeed, this division of responsibility has been incorporated into the practice of the United States Army in the European theatre, where the prevention of the venereal diseases is delegated to the Division of Preventive Medicine and the treatment of these conditions to the Division of Professional Services.

The scope of a programme of prevention for the venereal diseases falls into three divisions. The usefulness of the epidemiological method and its prime importance in defining the places for emphasis and the points of attack have been discussed. Dependent on the information brought out by epidemiological studies, a programme of education promises most in limiting incidence. The methods are in some instances general; in others specific. The stress given to each depends on the demonstrated behaviour of the several diseases in a given set of circumstances. The general educational approach should endeavour to elicit public support for the preventive methods which apply both to the individual and to the community; and for special education of particular groups on the value of such methods as notification and provision of proper treatment.

As in general public-health education, posters, moving pictures and lectures are all useful. Newspaper publicity is perhaps most valuable of all the tried methods of mass appeal but the wireless is almost undeveloped. In a wide experience the most valuable general educational method has proved to be the informal discussion in small groups. Each person in such a group becomes a public-health educator, and while the method is time-consuming and expensive at the outset, the eventual results are excellent.

Specific methods of public-health education in the venereal diseases are directed essentially towards two groups—the medical profession and public-health authorities. Here again a modification of the small group method has proved invaluable. A coördinator, well versed in the general programme which has been agreed on, visits local health authorities, outlines the principles of a satisfactory programme and makes specific suggestions in view of local conditions. This method has proved so valuable in civilian practice that it forms the basis for the programme of the United States Army. Qualified medical officers are specifically assigned to major commands as venereal-disease control officers.

The practice of preventive medicine has gone far beyond the epidemiological study and the education of populations in good health measures. The extent to which social and economic factors contribute to the prevalence of disease is becoming increasingly evident. Thus in an attack on the venereal diseases all the community's resources must be brought into play. The interest and activity of public-health authorities must be directed by public opinion towards increased activity in the repression of prostitution. Military authorities perhaps more than civilian communities have recognised and utilised substitutive activities as an important factor in the prevention of venereal disease. Almost every army has become convinced of the futility of punishment as a preventive measure. The same point of view should be adopted by civilian populations, but this will require a change in public opinion, changes of economic circumstances to permit earlier marriage, and correction of innumerable social problems which in the past have often required centuries. There is, however, no need to wait. Much can be done now. In Canada, for example, health authorities have acted through strictly voluntary methods. Epidemiological studies showed that an undue proportion of venereal infections came from certain dance halls, beer parlours, rooming houses and cheap hotels. Health officers visited the proprietors of these establishments and through their coöperation arranged for stricter supervision and self-imposed regulations prohibiting entrance of unescorted women; a division of facilities with separate rooms for unaccompanied men; and improvement of conditions in rooming-houses and hotels through enlisting the interest of property owners and real-estate agents. Where pressure was needed the interests of the brewery industry were enlisted or the threat of cancelling licences was employed. An awakened and energetic public opinion does not require compulsory legal backing.

SUMMARY AND CONCLUSIONS

Public interest is being increasingly aroused to the importance of the venereal diseases, both to the Armed Forces and the civilian population. This gives promise

of permanency and already has provided an impetus to the improvement of methods, procedures and attitudes. The danger of dissipation of effort through misdirected and unequal emphasis makes necessary a critical review of existing programmes of control, that balance and effectiveness be assured.

It is an epidemiological principle that successful control of a communicable disease depends on the recognition and elimination of the sources of infection. The venereal diseases are communicable diseases. An adequate programme for medical care of persons suffering from either of the two most common would effectively eliminate them, providing such facilities were known to all persons, that those who needed them were aware of the need, and that they would voluntarily use them. Experience has shown however that provision of medical care is not enough. Equally essential is an effective programme of prevention utilising all the forces of public health. This is logically based on an understanding of the nature of the disease involved, both as a clinical phenomenon and as a biological entity; on evaluation and definition of methods for diagnosis; on appreciation of the distribution of the disease in time and space; the means by which it is transmitted; and development of methods for interrupting its spread.

The community as a whole must accept the responsibility for educating the individual in the venereal diseases; for epidemiological studies necessary to define the extent of the problem and to expose the vulnerable points for attack; and for providing those control measures which can only function as a community responsibility. On the other hand, the individual is obliged, through enlightened appreciation, to give support to the community programme, and to practise the control methods which are based on individual initiative.

GRAMICIDIN S

ORIGIN AND MODE OF ACTION

PROF. G. F. GAUSE
CHIEF OF THE MICROBIOLOGICAL DEPARTMENT

M. G. BRAZHNIKOVA
RESEARCH FELLOW

From the Institute of Tropical Medicine, Moscow, USSR

IN the summer of 1942 we undertook a systematic investigation of various strains of antagonistic sporulating bacilli from Russian soils. Although antagonistic action upon agar plates was often recorded, the broth cultures of the antagonistic strains of aerobic sporulating bacteria were usually ineffective or only slightly effective in killing staphylococci. Among several hundreds of isolated strains only one culture, isolated from a garden soil, was remarkably effective in doing so. In subsequent work it was designated as the Gause-Brazhnikova strain, and served as a source for isolation and large-scale production of a new bactericidal polypeptide which was given the name of "Soviet gramicidin" or gramicidin S.

The organism we have isolated belongs to the *Bacillus brevis* type as described by Stokes and Woodward (1942). It produces alkali in sucrose broth and H_2S in peptone broth. We compared it with the strain of Dubos (1941), which we had at hand, and found it somewhat similar though by no means identical in growth properties. The Gause-Brazhnikova strain is thermophilic and grows at temperatures up to 60° C, though the best production of gramicidin S is observed at 40–41° C.

PRODUCTION AND CHARACTERISTICS

The bacteria are grown on 10% yeast autolysate with 0·5% of glucose in large vessels with a depth of liquid not exceeding 5–6 cm.

After 6 days' incubation at 40–41° C the culture fluid is acidified by HCl to pH 4·7, the supernatant liquid is discarded and the sediment is somewhat concentrated with the aid of a supercentrifuge. The concentrated sediment is then spread on large dishes and dried overnight at 50–60° C. The dry mass is ground to a fine powder in a ball-mill. To each kilogramme of the powder 4 litres of alcohol is added, and about 5% alcoholic solution of gramicidin S is obtained. It is then diluted with alcohol to 4% concentration, passed through a Seitz filter, sealed in ampoules and used in clinical practice at this stage of purity. The extraction of bacterial mass with alcohol is repeated three or more times. The yield of dry gramicidin S is about 400–500 mg. per l. of bacterial culture, but it rises to about 750 mg. when peptones are added to the nutritive medium.

Preparation of pure crystalline gramicidin S.—We early recognised that the active antibacterial principle elaborated by our strain of bacteria is fundamentally different from that described by Dubos (1941). When alcoholic extract of the acid precipitate of our bacterial culture is simply poured on a watch-glass and left for a few minutes at room temperature, the active principle readily crystallises from it in the form of thin colourless needles. This is the best reaction for identification of the specific substance produced by our strain: it never occurs with the tyrothricin of Dubos, which is an amorphous body and can be fractionated into individual crystalline substances only by chemical treatment.

The following method is used to obtain the active principle elaborated by our strain of bacteria in the pure crystalline form.

1 vol. of the crude alcoholic extract of gramicidin S is mixed with 3 vol. of water, and repeatedly extracted with ether to eliminate lipoid substances. The lipoid-free solution is evaporated to dryness at 37–40° C. The dry residue is dissolved in a small amount of warm alcohol on a water-bath at 40–45° C. Charcoal is added, the warm solution is rapidly filtered from it and placed on ice. The active principle rapidly crystallises. The crystalline mass is filtered from the mother liquor and washed several times by cold acetone upon the filter. The active substance is further recrystallised twice or more from the acetone-water solutions with the charcoal and is each time washed with pure cold acetone.

The crystalline body thus obtained shows the following characteristics which are here compared with those of gramicidin Dubos, and tyrocidine hydrochloride, derived from tyrothricin:

	Melting-point	N% (Kjeldahl)	Biuret reaction
Gramicidin S	268–270°	13·0	+
Gramicidin Dubos	228–230°	14·8	+
Tyrocidine hydrochloride	240°	14·3	+

Hence it is clear that gramicidin S is a new substance different from the other known crystalline polypeptides produced by aerobic sporulating bacilli. A. N. Belozersky and T. S. Passhina have demonstrated that it has some unique chemical characteristics (see next paper).

ANTIBACTERIAL ACTION

The 4% alcoholic solution of pure crystalline gramicidin S was first diluted with water, and then mixed with equal volumes of the nutritive broth, which in many of the experiments contained 10% of human serum. One drop of bacterial culture was put into each tube, and the latter were incubated overnight at 37° C. The bacteriostatic action was judged from the absence of growth of the bacteria. The contents of each tube were then plated upon the nutrient agar, and the bactericidal action was concluded from the absence of growth in the plating. The bactericidal concentrations in most instances approached bacteriostatic ones. The results with some gram-positive bacteria are given in table I.

TABLE I—ACTION OF GRAMICIDIN S ON GRAM-POSITIVE ORGANISMS

Bacteria	*Bacteriostatic concentration in nutritive medium μg. per c.cm.*
Staph. aureus (18 different strains)	10
Streptococcus (10 strains)	10
Diplococcus pneumoniæ	10
Clostridium welchii	7
Cl. histolyticum	7

A comparison with tyrothricin (Lederle) showed gramicidin S to be somewhat more efficient in killing staphylococci, whereas tyrothricin is more active in killing streptococci and pneumococci. Gramicidin S is less selective than tyrothricin in its antibacterial action. The latter point becomes clearer when we compare the action of gramicidin S and tyrothricin upon various gram-negative bacteria (table II).

TABLE II—ACTION OF GRAMICIDIN S COMPARED WITH THAT OF TYROTHRICIN ON GRAM-NEGATIVE ORGANISMS.

Organism	Concentrations in nutritive broth														
	Gramicidin S (μg. per c.cm.)							Tyrothricin (μg. per c.cm.)							
	400	200	100	50	25	12	6	C	400	200	100	50	25	12	6	C
Salmonella abdominalis	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+
S. paratyphi A	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+
B. dysenteriæ	−	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+
Vibrio choleræ	−	−	−	−	−	+	+	+	..	..	..	..	..	..	..	..
B. proteus vulgaris	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
Bact. coli	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+

+ = growth present. − = growth absent. C = control.

Whereas tyrothricin is ineffective against all gram-negative bacteria studied (this accords with the findings of other workers), gramicidin S prevents the growth and kills many varieties of gram-negative bacteria suspended in nutritive broth. Among these, *B. proteus vulgaris* and *Bact. coli* are noteworthy because of their wide distribution in infected wounds.

TOXICITY AND STABILITY

The greater range of activity of gramicidin S, as compared with tyrothricin, is not associated with any greater toxicity. Numerous tests have shown that, for white rats, LD 50 (that is, the dose causing a 50% mortality) of gramicidin S, given intraperitoneally, is 17 mg. per kg. of body-weight—thus almost coinciding with LD 50 for tyrothricin as established by Robinson and Molitor (1942). Moreover, solutions containing 400–800 μg. of gramicidin S per c.cm., as used in clinical practice, do not interfere with the activity of leucocytes in human wounds when applied locally or in cavities. This was determined by cytological observations made according to the method of Dr. M. Pokrovsky, which entails microscopic examination of a series of imprints made on glass slides from the surface of a wound. Dr. E. Kost and Dr. M. Stenko in the Botkin Hospital at Moscow have shown that in wounds regularly and abundantly irrigated with a watery solution of gramicidin S the growth of fibroblasts and macrophages is very active. Dr. L. Levinson of the histological laboratory of the University of Moscow recorded the favourable action of gramicidin S on regenerating tissues of the wound, and particularly the high nucleic acid content of the cells.

A peculiar feature of gramicidin S is its great stability. In the dry crystalline form it loses none of its antibacterial activity on being heated to 160° C; nor does autoclaving at 120° C for 30 min. reduce the activity of watery solutions. When tyrothricin to which 1% of hydrochloric acid has been added is heated for an hour, flocculation is visible and activity reduced. Neither reduction of activity nor flocculation are observed when gramicidin S is treated in the same way. After hydrolysis into constituent amino-acids, however, as described in the next paper, any antibacterial activity of gramicidin S disappears.

The addition of 4% of lipoid substances to weak watery solutions of gramicidin S does not reduce its activity against gram-positive bacteria, although it reduces somewhat the strength of its killing action on the gram-negative bacteria studied.

PROPHYLACTIC POWERS AGAINST ANAEROBIC INFECTION

Lacerated wounds of muscles in guineapigs were infected with *Cl. welchii*, treated either with watery solution of gramicidin S containing 400 μg. of this substance per c.cm. (experimental animals) or with physiological saline (controls); the wounds were then sutured. The mortality in animals treated by gramicidin S was 5%, whereas in control animals it attained 53%. Similar experiments were made on 48 white rats, where the experimental wounds were infected with a fixed quantity of garden soil. The mortality of controls was 100%, whereas in the rats treated by gramicidin S it was only 40%. Hence it is clear that gramicidin S possesses some capacity to prevent anaerobic infection in animals.

SUMMARY

A new strain of aerobic sporulating bacteria has been isolated which produces a new and hitherto unknown crystalline polypeptide with the melting-point 268–270° C. This substance has been named Soviet gramicidin or gramicidin S.

It kills not only gram-positive but also gram-negative bacteria suspended in nutritive broth.

Its toxicity is no greater than that of tyrothricin, and it is harmless when applied locally or in cavities in concentrations of 400–800 μg. per c.cm. of solution.

Gramicidin S is stable and its antibacterial activity is not destroyed by autoclaving.

It has been shown to protect against anaerobic infection in animals.

Methods for its production on a large scale are described.

CHEMISTRY OF GRAMICIDIN S

A. N. BELOZERSKY T. S. PASSHINA

From the Institute of Tropical Medicine

Gramicidin and tyrocidine hydrochloride discovered by Dubos (1941) have already been subjected to detailed chemical study by Hotchkiss (1941), Christensen et al. (1941), and Gordon et al. (1943). Gramicidin S (Gause and Brazhnikova 1943) differs sharply from them in melting-point and biological behaviour.

Insoluble in water, acids and alkalis, gramicidin S is easily soluble in alcohol, and with more difficulty in acetone. It can be hydrolysed with difficulty. When heated with 22% hydrochloric acid, it goes into solution only after 18–20 hours' heating, and complete hydrolysis is observed only after 35–36 hours.

Crystalline gramicidin S melts at 268–270° C, and contains 13% of nitrogen (Kjeldahl). It gives a positive biuret reaction, but the xanthoproteic reaction, Millon reaction, Pauly reaction with diazobenzol-sulphonic acid, Voisenet reaction for tryptophan, and Sakagushi reaction for arginine were all negative. Unlike the gramicidin of Dubos, gramicidin S acquires a deep blue colour when treated with ninhydrin, and this colour immediately passes into amyl alcohol. The positive reaction with ninhydrin demonstrates the presence in gramicidin S of free amino-groups in the α-position. The same is also confirmed by the capacity of gramicidin S to react with nitrous acid. Free carboxylic groups are also present in gramicidin S, in so far as it can be titrated by the method of Willstätter and Waldschmidt-Leitz.

The determination of amino-N by Van Slyke's method with HNO_2 yields the following figures: after 5 min. 1·64%; after 30 min. 1·87%. The coincidence of these figures demonstrates that amino-groups are present in gramicidin S in the α-position alone. The titration by Willstätter's method gives for amino-N 1·97%. The presence of free α-amino groups in gramicidin S shows that it is not a cyclopeptide, and hence fundamentally differs from gramicidin of Dubos.

A further study of the products of hydrolysis of gramicidin S has also shown a number of important differences between this substance and those discovered by Dubos and Hotchkiss. Complete hydrolysis in 22% hydrochloric acid was reached in 36 hours. The completeness of hydrolysis was controlled by cessation of increase in amino-N. The hydrolysate contained 97% of nitrogen in the crystalline gramicidin S used for hydrolysis. The following reactions were all negative in the hydrolysate: Millon reaction, Voisenet reaction for trytophan, Sakagushi reaction for arginine, Pauly reaction for histidine and xanthoproteic reaction. The negative results obtained both with gramicidin itself and with the products of its hydrolysis demonstrate that gramicidin S does not contain tryptophan, tyrosine, phenylalanine, arginine and histidine; nor were aspartic and glutamic acids discovered in the hydrolysate (Foreman method). The distribution of nitrogen in the hydrolysate was:

Nitrogen	%	*Nitrogen as NH_2*
Hyminic	0·30	90·1%
Amidic	0·72	
Basic	27·02	
Mono-amino-acid	71·96	

Study of the basic fraction of the hydrolysate has shown that it does not contain arginine and histidine, and that not all amino groups are in the α-position, although the whole N of this fraction is amino-N. The picrate obtained did not explode at 252° C as that of lysine does, and its melting-point coincided with that of the picrate of ornithine. The amount of ornithine contained in gramicidin S was 18%.

It is remarkable that in the hydrolysate of gramicidin S some amino-N is not in the α-position (i.e., it is revealed after reaction with HNO_2 for 30 min.) whereas in the crystalline gramicidin S the whole amino-N was α-amino-N. Probably in the molecule of gramicidin S the δ-amino group of ornithine is bound, and only freed in the process of hydrolysis. These structural relations are very suggestive.

Among mono-amino-acids present in the hydrolysate we have so far discovered 10–15% of proline and have isolated about 70% of pure crystalline leucine. This investigation will be continued.

The results of our investigation are here summarised:

RESULTS OF INVESTIGATIONS

	Gramicidin Dubos	Tyrocidine hydrochloride	Gramicidin S
Melting-point	228–230° C	240° C	268–270° C
Molecular weight (Rast)	1250–1550	1260	1060–1340
Free NH_2	−	+	+
Free COOH	−	+	+
Time of dissolution on hydrolysis (hours)	18	2	18–20
Total N (Kjeldahl)	14·8%	14·3%	13·0%
Tryptophan	+	+	−
Tyrosine	−	+	−
Dicarbonic acids	−	+	−
Phenyl-alanine	−	+	−
Proline	−	+	+
Ornithine	−	+	+
Leucine	+	+	+

It is clear that gramicidin S represents a new and hitherto unknown crystalline polypeptide, which differs from both gramicidin of Dubos and tyrocidine hydrochloride.

CLINICAL USE OF GRAMICIDIN S

PROF. P. G. SERGIEV

VICE-PRESIDENT OF MEDICAL RESEARCH COUNCIL OF USSR

Although the discovery and wide application of sulphonamides was an important step in the advance of modern medicine, some of their weak points became evident as soon as they were used in war surgery. The first is their feeble action against the staphylococcus, which is such a common invader of war wounds; the second is that their local application somewhat desiccates the wound and retards regeneration. Hence the search for new antiseptics, of biological origin, free from these disadvantages.

Gramicidin S is a new substance of this kind, capable of killing many pathogenic bacteria. Its antibacterial action is more universal than that of tyrothricin, and applied locally to wounds or cavities in the specified concentrations, not only is it harmless but it even stimulates healing. The Medical Research Council of the USSR released it for wide medical trial in July, 1943, and this paper is based on the results of its use in 1500 cases in ten leading Soviet hospitals.

APPLICATION

Gramicidin S is distributed in ampoules containing 4% alcoholic solution of the dry substance. In this form it has proved to be stable for at least two years, perhaps indefinitely. When required for use it is diluted 100 times with water, so that each c.cm. of solution contains 400 μg. of gramicidin S. It is also employed in an ointment, the original 4% solution being diluted 50 times with castor oil. It is soluble and stable in this and some other oils, and it readily passes from them into water. For treatment of skin infections the initial solution is diluted 100 times with 70% alcohol. A characteristic feature of gramicidin S, not recorded for tyrothricin, is its power of alleviating pain.

RESULTS

Suppuration of soft tissues.—The 300 cases in this group comprise gunshot wounds of soft tissues at the stage of necrosis, severe burns, abscesses of the abdominal wall, and anaerobic infections. The watery solutions of gramicidin S were abundantly applied daily for 4–5 days, at which time the bacteria usually disappeared from the infected wound. Thenceforward gramicidin ointment was used sometimes every 2–3 days. Many cases of long-standing suppuration (6–8 months' duration) responded well to gramicidin treatment and were healed in 20–30 days. Most of the clinical observations were accompanied by repeated bacteriological examinations, and with studies of phagocytosis in the wound and measurements of the phagocytic activity of leucocytes in the peripheral blood. The disappearance of necrotic tissue and the appearance of granulations and epithelialisation were very rapid. The following are examples.

CASE 1.—A man of 28. Severe burns of abdomen, of both hips and round the knee-joints. Treatment by usual methods for two months was unsuccessful. Temperature 39° C; much suppuration of burned tissues with *Staph. aureus* in the pus. Gramicidin therapy started June 8, 1943, and continued daily. On June 12 the temperature was normal, the state of the patient had improved remarkably, and only a few bacteria were found in the wound exudate (mainly intracellular). On June 22 all the burned surface was covered with fresh granulation tissue and a third of it was epithelialised.

CASE 2.—A man of 22, with numerous severe wounds of hands, legs, face and head caused by a mine. Loss of the left eye. Temp. 38–39° C; *Staph. aureus* and *B. proteus* in the pus. After two days' treatment with gramicidin S the appearance of the wounds was much improved, suppuration was reduced and the swelling of the face and right eyelid had decreased so much that the patient could use his right eye. After 9 days' treatment his state was entirely satisfactory.

Preparation for skin-grafting.—The wound surface was freely irrigated with the watery solution of gramicidin S before and after transplantation of skin-grafts, and the results were always favourable.

Osteomyelitis.—The following is an example.

CASE 3.—A man of 48 had an open fracture of the tibia and fibula in the lower third and a fracture of the astragalus. These were complicated by traumatic osteitis with extensive suppuration and partial necrosis of soft tissues. The general condition was poor; temperature up to 40° C. Daily application of watery solutions of gramicidin S was begun on April 30, 1943. In 3 days suppuration was arrested and the general state improved. Temp. 37–37·4° C. After sequestrectomy the patient rapidly recovered.

In cases of chronic osteomyelitis the solution was applied on the operating table, immediately after sequestrectomy.

CASE 4.—A man of 26. Admitted to hospital on April 8 with osteomyelitis of the os calcis. All dead bone was removed on April 24. A tampon was inserted saturated in watery solution of gramicidin S, 800 μg. per c.cm. After 3 days the tampon was changed; no pus was found. Recovery without suppuration.

Empyema and peritonitis.—In this group also the application of watery solution of gramicidin S was valuable, as in the following example.

CASE 5.—A man of 38, admitted to hospital on June 10, 1943, with a diagnosis of abscess of the right lung and right-sided empyema. Felt ill, temperature 37·8° C. *Diplococcus pneumoniæ* found in the exudate. First aspiration on June 10: 250 c.cm. of viscous stinking pus sucked out of pleural cavity and 100 c.cm. of watery solution of gramicidin S introduced into it. On June 12, 50 c.cm. of liquid pus was aspirated and 50 c.cm. of the watery solution of gramicidin S introduced. On June 14 the exudate was sterile. Radiogram on June 15 showed that the pleura contained no fluid and that traces of the abscess cavity were insignificant. Rapid recovery.

Skin infections.—This group includes 267 cases. The best results were obtained with diluted alcoholic solutions of gramicidin S containing 400 μg. per c.cm. of alcohol, and also with ointments. In 117 patients with contagious impetigo treated with alcoholic solution of gramidicin S the time of recovery was on the average 4·1 days. In 23 patients with more deeply seated injuries of the skin of the ecthymic type, the time of recovery was on the average 6·8 days; 70% of chronic suppurations of the skin that had lasted from 3 months to 3 years were completely healed in 16–31 days.

Prophylactic use.—The number of cases studied prophylactically is insufficient for definite conclusions to be drawn, but all wounds treated prophylactically with gramicidin S healed by first intention.

This article is based on observations of Dr. K. Zirkunenko, Dr. E. Kost, Dr. M. Stenko, Dr. N. Gulaeva and Prof. A. Prokoptchuk.

REFERENCES

Christensen, H., Edwards, R., Piersma, H. (1941) *J. biol. Chem.* **141**, 187.
Dubos, R., Hotchkiss, R. (1941) *J. exp. Med.* **73**, 629.
Gause, G., Brazhnikova, M. (1943) Soviet Gramicidin and Wound Healing, Moscow.
Gordon, A., Martin, A., Synge, R. (1943) *Biochem. J.* **37**, 86, 313.
Hotchkiss, R. (1941) *J. biol. Chem.* **141**, 171.
— Dubos, R. (1941) *Ibid*, p. 155.
Robinson, H., Molitor, H. (1942) *J. Pharmacol.* **74**, 75.
Stokes, J., Woodward, C. (1942) *J. Bact.* **43**, 253.

AMŒBIC DYSENTERY

FACTS AND FALLACIES IN RADICAL TREATMENT

SIR PHILIP MANSON-BAHR, CMG, DSO, MD CAMB., FRCP

THOSE who have specialised in tropical medicine believe that they possess an array of specific drugs, unrivalled in their potency in all other branches of medicine. It is therefore somewhat disturbing to find that now, when effective treatment of many tropical diseases contracted on war service is so necessary, our cherished and apparently well-founded views are being called in question by medical officers whose experience of these conditions is somewhat limited—witness the depressing account of the treatment of amœbiasis in India by Leishman and Kelsall.[12] The treatment of this disease is the case in point, for it is essentially a chronic infection and it should be realised that it may persist unchecked for 30–40 *years* or even longer; that clinical relapses are the rule and that silent periods may ensue lasting sometimes several years. We hoped, with some reason, that of all the ills which afflict mankind this was one over which, in the words of Dobell, we possess the most complete mastery, and that this is mainly due to the sane therapeutic use of emetine introduced by Sir Leonard Rogers[24] in 1912. The immediate effects of injections of this, the chief alkaloid of ipecacuanha, on the acute stage of amœbic dysentery, with active forms of *Entamœba histolytica* in the fæces, exceeded anything seen previously in the accepted ipecacuanha treatment as practised by Sir Patrick Manson. But, as with all new methods of treatment, preliminary reports were unduly optimistic; it was not sufficiently realised that a long "follow-up" is necessary in order to pronounce absolute cure, and indeed success is still claimed after an observation period of six weeks or two months.

It was some time before the four-nucleated cysts were generally recognised as the cystic stage of *E. histolytica*. Precystic forms and cysts of *E. histolytica* were studied by Huber[9] in 1903, though the cysts had been previously seen and figured by Quincke and Roos[22] in 1893. They were again seen by Viereck[25] in 1907 and by Hartmann[8] in 1908, but because some confusion in nomenclature reigned it was not till 1912, as the result of studies by Wenyon,[27] that the typical cysts were generally recognised as distinct from those of *E. coli*.

Soon afterwards it became apparent that in chronic amœbic dysentery (with cysts in the fæces) injections of emetine hydrochloride, however large in amount and however prolonged, exerted no recognisable effect on this stage of the parasite, so that symptoms persisted in spite of this specific treatment. These important and basic facts do not appear to have been appreciated by many physicians now treating amœbiasis. From the studies of a number of eminent protozoologists, notably Wenyon, it has been shown that the cystic stages of *E. histolytica* are derived from precystic forms; that these are not usually found in amœbic ulcers but congregate on the mucous surface of the bowel, where they lie embedded in mucus to be swept into the lumen by the onward rush of fæces, by which means they leave the body as mature cysts in order to complete the evolution of the organism and aid in its dispersal.

LIMITATIONS OF EBI AND QUINOXYL ALONE

Emetine, when injected, and presumably distributed by the blood-stream, is not to any extent excreted in the fæces, and therefore does not come directly into contact with the precystic forms; so to extirpate these the drug must be introduced directly into the alimentary tract. This was achieved by the elaboration of the double iodide of emetine and bismuth by Dumez[6] in 1915. This is a compound from which emetine is liberated in the intestinal contents by decomposition in an alkaline medium into emetine and bismuth sulphide. The therapeutic effect of EBI (as it came to be called) on chronic amœbic dysentery with cysts in the fæces was subjected to stringent clinical tests by Dale,[3] Carmichael Low[14] and Dobell[5] from 1916 to 1918. They found by daily microscopic observations on the fæces in a series of cases that cysts disappeared directly the patient came under the influence of this drug, and these observations were supported by many others about this time.[5]

At the termination of the 1914–18 war, especially during the years 1920–24, a large number of war pensioners were definitely and permanently cured by emetine bismuth iodide. Nevertheless, a certain proportion (about 12%), as shown by Rennie[23] on a series under my care, subsequently relapsed, and the most refractory were those who had been previously subjected to a *long series of hypodermic emetine injections*. At that time I was able to agree with J. G. Willmore that it was quite useless in these resistant cases to continue with intensive EBI treatment. One case, in particular under my care, relapsed after nine separate and exhausting courses of EBI.

However, during the last 25 years I have been continuously engaged in the treatment of chronic amœbic dysentery and have been able to keep accurate follow-up records for 10–15 years. From these records I can state that amœbiasis, both in the acute and chronic stage, is a curable disease for which we possess specific drugs. 'Quinoxol' or 'Yatren' (now known as 'Anayodin' or chiniofon *BP*), a combination of iodine with oxyquinoline-sulphonic acid, was found by Mühlens and Menk[19] in 1921 to cure chronic amœbic dysentery which had previously proved refractory to EBI. This somewhat startling claim was soon confirmed by a whole array of workers[1 4 10 11 18 17] in the Dutch East Indies and China, while Vogel[26] was able to show that chiniofon was almost as toxic as emetine to *E. histolytica* in culture. It soon became apparent that, when introduced into the rectum in the form of retention enema (in 2·5% solution) it was more effective than when taken by mouth. In 1925 I showed in 15 cases treated simultaneously by the mouth and rectum that it could not be relied on to cure every case, for a quarter subsequently relapsed. (Some, like Lichtenstein,[13] claimed to have secured better permanent results by increasing the strength of the solution to 10%, but this is probably incorrect since the maximum solubility of the compound is about 4%.) Rectal therapy was controlled by sigmoidoscopy, by which means I was able at this time to observe directly the healing of amœbic ulcers in the rectum. It therefore became apparent that some better mode of treatment would have to be devised to cure refractory war infections.

In the meantime other compounds of emetine—emetine periodide and 'Auremetine' (Martindale,[16] Willmore,[28] Gordon[7])—were subjected to therapeutic trials, but neither of these, though sometimes better tolerated, appeared to possess any more strikingly potent therapeutic qualities than EBI.

COMBINED TREATMENT

Acting on these considerations from 1926[15] onwards I adopted a method of combined treatment with the

two most specific antiamœbic drugs—emetine bismuth iodide and chiniofon. This method has been described in detail in recent editions of *Tropical Diseases* (11th ed., p. 544) and in *Dysenteric Disorders* (1943, p. 188). From 1920 onwards I have compiled records of over 1000 cases of chronic amœbiasis, and in the Lumleian lectures[16] for 1941 a critical study of 535 specially selected cases was published.

Before treatment by the combined method nearly half of these cases had received protracted hypodermic emetine therapy, and ample evidence was obtained that the common practice (then as now) of periodic courses of emetine injections tends to produce an emetine-fast strain of *E. histolytica*. Moreover, numerous instances of emetine intoxication were described; some of these cases had received as much as gr. 70–120 of this drug spread over a period of 2–3 months. In several partial paresis of the legs had thereby been produced. (These clinical observations are supported by the experimental evidence of Bonnin and Aretas,[2] who by exposing *E. histolytica* in cultures to increasing concentrations of emetine found it was possible to produce strains resistant to this drug.)

This combined, or synergic, treatment consists of giving EBI at night in doses of gr. 2–3 for 10 nights; gr. 30 should be the maximum, but usually a total of gr. 20 suffices. Certain essential precautions must be taken—

EBI.—The patient must be confined to bed for the whole period. No solid food should be taken for four hours before the administration of EBI and some sedative, like phenobarbitone gr. 1, or tinct. opii min. 10, given at 9.30 PM, half an hour beforehand to prevent vomiting. In sensitive patients all saliva should be wiped from the mouth and the patient induced to go to sleep.

Chiniofon retention enemata should be given concurrently with EBI during the daytime. After a light breakfast at 8 AM a 2% sodium bicarbonate enema of a pint is administered by a Higginson syringe to cleanse out the lower bowel. The chiniofon retention enema (2½ % solution in 7 oz. warm water) should be slowly run into the rectum with a no. 10 rubber catheter with the patient lying on his *left* side; when the solution has entered the rectum he should turn on his back for half an hour, and then on his right side, so as to facilitate percolation throughout the large intestine. The abdomen should be massaged anticlockwise. The foot of the bed should be raised about a foot on blocks. (This precaution is too often omitted.) Most patients can retain the solution for 8 hours. Chiniofon is to some extent absorbed from the bowel and can be recognised in the urine by the ferric chloride test. Ten consecutive treatments can be given daily in combination with the EBI.

This treatment is not exhausting to the patient, and if it is properly conducted the EBI is usually tolerated without inconvenience. It is not claimed that this combined therapy invariably cures every case, or that relapses do not occur. In a series of 361 so treated there was a relapse-rate of 3·7% within a year; but this residuum was finally cleared of infection by a further course of the same treatment combined with protein shock therapy. It is suggested that this reaction in some way reinforces the action of the antiamœbic drugs.

We have the testimony of Willmore,[29] to whom fell the responsibility of treating last-war pensioners for the Ministry of Pensions, that a similar favourable result was obtained in a series of 200 of his cases.

COMMON FAILINGS IN TREATMENT

It is now necessary to attempt to explain why many apparently incurable amœbic dysenteries are being encountered in soldiers returning mainly from India and Burma, and how it is that this well-tried method of treatment appears to be so little practised or appreciated.

First, as regards EBI: it is obvious that to produce its effects the drug must be properly absorbed, and this is not invariably so. EBI is best dispensed in gelatin capsules, and when it is encased in stearin or salol, or sugar-coated in tablet form, the coating may become insoluble so that the tablets pass through the intestinal canal unchanged. Sometimes, too, after storage in a hot climate the gelatin becomes so indurated that the capsules fail to explode, as they should, in the duodenum, and are passed out in the stools unchanged; this has actually been found to be the case at present. It is therefore good practice to prick them with a pin to aid their solution. Sugar-coated tablets are now in vogue. On the whole they are satisfactory, but this coating may also be so hardened that it is advisable to scrape away a portion before administration. When EBI is being adequately absorbed the recipient should experience a sense of nausea within about two hours. The fæces should be liquid and dark in colour (due to liberated bismuth). If these signs do not appear the drug is not being absorbed. As a further check, the stools must be searched daily to see that tablets are not being passed whole.

Other fallacies centre round the chiniofon retention enema. On questioning patients referred with so-called incurable war-time amœbic dysentery it is sometimes found that the principles of a *retention* enema are not sufficiently appreciated. Occasionally the enema is given as a bowel wash; much too large quantities are employed, with the result that it is voided immediately instead of being retained for a long period. The essential point is that the amount should not exceed 7 oz. and it should be injected into the rectum very slowly. The ritual of the technique must be carefully observed.

It is not proposed to weary the reader with the examples of cure in long-standing and refractory cases which are recorded in *Dysenteric Disorders* (2nd ed., p. 194), but to support my contentions it appears advisable to quote the following remarkable example of a story which is common just now.

A regular soldier had originally contracted the infection in India and had spent the greater part of his 15 years' service in hospital or under ambulatory treatment for chronic amœbiasis. After being subjected to the usual array of antiamœbic drugs, including Kurchi bark and its derivatives, for 6 years, he was finally invalided to England. The story for the next 7 years is much the same. Amœbic hepatitis was followed by liver abscess, but according to some accounts the material evacuated at operation resembled hydatid fluid. This could not be confirmed, but the intradermal Casoni test was subsequently positive. In December, 1942, he began to cough up liver pus once more and was admitted to a London hospital, where *E. histolytica* cysts were found in large numbers in the fæces. In spite of emetine, EBI and chiniofon retention enemas the cysts persisted. In May, 1943, he was referred to me. At this time he was complaining of hepatic pain and nausea and the fæces still contained many *E. histolytica* cysts. After a period on a strict milk diet he was given two protein-shock treatments; then the combined EBI and chiniofon treatment was begun, which did not differ materially from previous courses except that precautions were taken to see that the drugs were absorbed. The *E. histolytica* cysts disappeared after the second day of treatment. The patient has been followed-up for the subsequent 1½ years and he has remained in good health. He is now employed in a munition factory.

OTHER REMEDIES

Space does not permit critical discussion on the merits of other antiamœbic drugs now in use. There are the arsenicals, acetarsol and carbarsone, which enjoy a great vogue in chronic amœbiasis. Their claims to extirpate this infection have never been satisfactorily proved, nor have any controlled clinical observations with a long follow-up been published. Other preparations allied to chiniofon—'Enterovioform' and 'Diodoquin'—are commonly used in the United States; but it is questionable whether permanent cures are always obtained by their use, or whether they are really more effective than the original chiniofon. There is therefore ample room for the introduction of still more efficient antiamœbic preparations. The common practice of giving all these various drugs in wearisome succession should be discouraged, because it never leads to any satisfactory evidence of their efficiency.

CONCLUSION

Hypodermic injections of emetine do not cure chronic amœbic dysentery. So widespread is this erroneous belief that to the average practitioner the mere suggestion of amœbiasis serves as an indication for uncontrolled emetine injections.

The common practice of periodic courses of emetine injections is injurious and should be discouraged as

liable to produce emetine-resistant strains of *E. histolytica*.

The combined treatment with emetine bismuth iodide and chiniofon now offers the best hope of a permanent cure, but the details of administration must be observed.

REFERENCES

1. Birt, E. (1923) *Münch. med. Wschr.* **70**, 205.
2. Bonnin, H., Aretas, R. (1939) *C.R. Soc. biol. Paris*, **130**, 495.
3. Dale, H. H. (1916) *Lancet*, ii, 183.
4. De Langen, C. D. (1923) *Geneesk. Tijschr. Ned. Ind.* **63**, 442.
5. Dobell, C., Gettings, H. S., Jepps, M. W., Stephens, T. B. (1918) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 15.
6. Dumez, A. G. (1915) *Philipp. J. Sci.* Sect. B. **10**, 73.
7. Gordon, R. M. (1923) *Ann. trop. Med. Parasit.* **17**, 381.
8. Hartmann, M. (1908) *Arch. Schiffs- u. Tropenhyg.* **12**, 117.
9. Huber (1903) *Dtsch. med. Wschr.* **29**, 267.
10. Huppenbauer, K. (1923) *Münch. med. Wschr.* **70**, 602.
11. Kuenen, W. A. (1922) *Ned. Tijdschr. Geneesk.* **66**, 1711.
12. Leishman, A. W. D., Kelsall, A. B. (1944) *Lancet*, ii, 231.
13. Lichtenstein, A. (1923) *Geneesk. Tijschr. Ned. Ind.* **63**, 612.
14. Low, G. C., Dobell, C. (1916) *Lancet*, ii, 319; Low, G. C. (1917) *Ibid*, i, 482; (1918) *Trans. R. Soc. trop. Med. Hyg.* **11**, 115.
15. Manson-Bahr, P. H. (1931) *Proc. R. Soc. Med.* **24**, 1538.
16. Manson-Bahr, P. H. (1941) *Brit. med. J.* ii, 255.
17. Manson-Bahr, P. H., Morris, R. M. (1925) *Lancet*, ii, 544.
18. Martindale, W. H. (1923) *Trans. R. Soc. trop. Med. Hyg.* **17**, 27.
19. Mello, S. (1922) *Brazil-med.* **36**, 45.
20. Menk, W. (1922) *Münch. med. Wschr.* **69**, 1280; **70**, 306.
21. Mühlens, P., Menk, W. (1921) *Ibid*, **68**, 802.
22. Quincke, H., Roos, E. (1893) *Berl. klin. Wschr.* **30**, 1089.
23. Rennie, P. M. (1922) *Lancet*, ii, 1374.
24. Rogers, L. (1912) *Brit. med. J.* i, 1424; ii, 405; *Ind. med. Gaz.* **47**, 421; (1913) *Lancet*, i, 129.
25. Viereck, H. (1907) *Arch. Schiffs- u. Tropenhyg.* **11**, 1.
26. Vogel, H. F. (1927) *Ibid*, **31**, 74.
27. Wenyon, C. M. (1912) *J. Lond. Sch. trop. Med.* **2**, 27.
28. Willmore, J. G. (1923) *Trans. R. Soc. trop. Med. Hyg.* **17**, 13.
29. Willmore, J. G. (1931) *Proc. R. Soc. Med.* **24**, 1546.

RODENT ULCER
TREATED BY APPLICATION OF SODIUM BICARBONATE

DUNCAN CAMERON, M D GLASG., F R F P S
HON. PHYSICIAN TO THE CUMBERLAND INFIRMARY, CARLISLE

IN November, 1934, a patient with a doubtful rodent ulcer was sent to me for an opinion. The lesion was thought to be a basal-celled carcinoma, but what struck me particularly about it was the amount of sebaceous material presenting at the patulous mouth of the ulcer. I wondered what would happen were this greasy matter removed, so I gave the patient a lotion of bicarbonate of soda, with a little glycerin added to prevent drying, and instructed him to apply this twice or thrice a day on white lint. In a month the ulcer had disappeared leaving a fine scar.

It happened that at this time an old woman was awaiting admission to one of my beds for radium treatment of a typical rodent ulcer. I treated the lesion with a similar lotion and it disappeared in 9 days.

No further cases were treated with sodium bicarbonate until March, 1938, when this old woman returned to see me. She had a new lesion behind and below the site of the previous one and separated from it by an interval of healthy tissue. The report on a piece of tissue from this ulcer was "rodent ulcer." The previous treatment was repeated and the growth disappeared within a month.

Since then, bicarbonate of soda has been used in the treatment of the comparatively few cases of rodent ulcer that have come to me. In all, 24 patients with, among them, 28 malignant growths of face or neck have presented themselves.

Of the 28 lesions 24 were submitted to histological examination and the histological findings and results of treatment in these cases are summarised in the table.

Of the 16 verified "simple" rodent ulcers (typical and atypical) 4 have been healed for over five years, 1 for over three years, and 3 for about a year. The time taken for cure, when treatment was carried out conscientiously, varied from 10 days to 10 months, but one of the unconfirmed lesions had 2½ years' treatment before cure.

The first 2 lesions in the whole series were not submitted to biopsy, for no serious experiment in treatment was then contemplated. Nor was biopsy considered necessary for the other 2 ulcers in the series, since the patient in whom they occurred was referred to me by the radio-consultant for the area. The first 2 of the unconfirmed lesions have beeen healed for over ten years. One of the last 2 has been healed for three years, while the other is healed but shows two pinheads of crust. Treatment in these cases varied in duration from nine days to over a year.

APPLICATION AND EFFECTS

The sodium bicarbonate has been applied on white lint as a simple saturated solution in water, as a water-saturated solution with glycerin added to prevent drying, or as water-glycerin lotions or pastes of various strengths. It has also been used as ointments of 15% or 30% in lanolin, eucerin or soft paraffin. The solutions or pastes are more effective than the ointments.

Where solution alone has been employed, there has been little or no obvious reaction. Where a strong paste has been used the area round the ulcer has become red, and purulent material has come away from the base, followed by separation of a slough and exudation of serum. The rolled edge has been ulcerated. Application of solution at this stage should result in healing.

It will be noted that, since the salt used is bland, the results obtained are not due to any caustic action. The fact that healing takes place shows that only the malignant tissue is adversely affected by the solution. The action of the sodium bicarbonate may be either direct or indirect.

If the action is direct, it may be physical or chemical. Physically, the sodium bicarbonate may increase the osmotic pressure of the lymph in which the cancer cells are bathed and thus damage them. Chemically, it may act by heightening the alkalinity of the lymph. By altering the pH it may inhibit the action of some enzyme such as the proteolytic one which constitutes the "diffusion factor."

If the action is indirect, the salt may, by virtue of its solvent properties, remove a local stimulating substance which has set up carcinogenesis. With removal of the irritant, the malignant bias might be gradually reversed. Muir[1] has shown that the onset of malignancy is a gradual process, so a return to normal by degrees seems a rational conception.

Whatever the action of sodium bicarbonate, it seems to be different from that of radium. It does not impair the effect of radium and is not prejudiced by the previous use of radium. Case 7 failed to respond to treatment by the sodium salt and was cured by application of interstitial radium. Case 8 was cured by sodium bicarbonate after interstitial radium had been unsuccessful. The salt may fail because interposition of fibrous tissue or healthy epithelium prevents its access to the malignant cells or their immediate surroundings. Case 2 (B) suggests this.

ILLUSTRATIVE CASES

1.—Miss A., aged 74, seen on March 10, 1938, had a small ulcer on the right cheek, first noticed in the previous July. Biopsy: "rodent ulcer." A lotion of 8% sod. bicarb. in water with an equal quantity of glycerin was used as a dressing. Slight erythema appeared after some days, but without other obvious change the ulcer had healed by March 30. The scar is now flat, smooth and sound.

2 (*a*).—Mr. B., aged 67, seen on May 21, 1938, had an ulcer (of which he was unaware) on the right side of the face

RESULTS OF TREATMENT OF 23 LESIONS EXAMINED HISTOLOGICALLY

Lesion	Died before treatment complete	Discontinued treatment	Healed	Growth arrested for 6 years or more	Failed	Totals
Typical rodent ulcers	1	2	4	3	2	12
Atypical rodent ulcers	..	..	4	..	..	4
Large rodents with epithelioma at edges or involving deep structures ..	..	..	..	..	3	3
Squamous carcinoma	..	..	1	..	..	1
Fibrosed epithelioma	1	..	..	..	..	1
Unconfirmed ..	..	..	2	..	..	2
Equivocal	..	..	1	..	..	1

1. Muir, R. *J. Path. Bact.* 1941, **3**, 155.

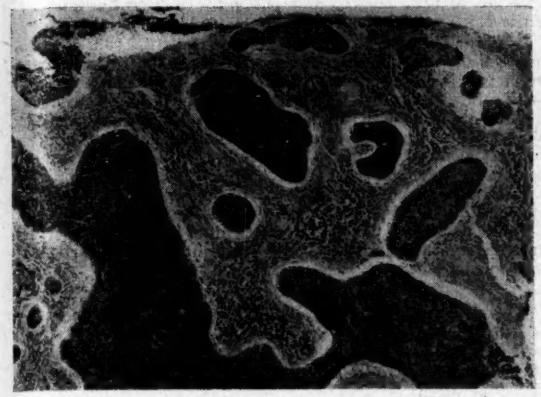
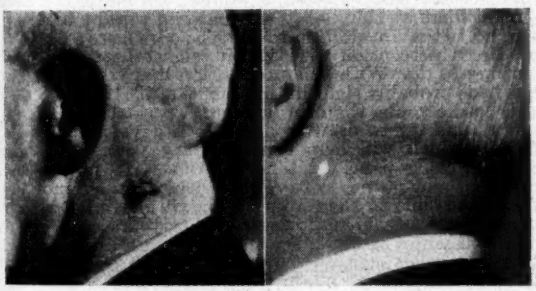


Fig. 1—Case 3: typical rodent ulcer

near the bridge of the nose. Biopsy: "mixture of rodent ulcer and cystic epithelioma." Dressings of bicarbonate solution with glycerin were applied. There was no visible reaction but the ulcer had disappeared by February, 1939, the site being represented by a thickening of the skin. A flexible sound scar remains.

2 (*b*).—He also had a sore on the right side of the nose at the junction of the ala and cheek, first noticed about two years previously. It consisted of two small deep holes connected by an irregular undermined gutter and surrounded by a waxy margin. It had had three courses (three doses each)



(*a*) (*b*)

Fig. 2—Case 4: (*a*) before treatment; (*b*) after treatment

of X rays and there was considerable fibrous tissue reaction. Biopsy: "rodent ulcer." After 22 months' treatment with bicarbonate, water and glycerin lotion, the lesion healed. Three months later it broke down and for 2 years it remained as a callous ulcer. It was then curetted and scrapings contained necrotic-looking rodent cells. Dressings of the lotion were applied, and 10 days later the ulcer seemed firmly healed. A small superficial ulcer developed on the scar, but curettage revealed no malignant cells. This ulcer has since broken down but has not spread.

3.—On July 19, 1938, Mrs. C., aged 79, was found to have a small ulcer ($\frac{1}{2} \times \frac{1}{4}$ in.) with a pearly surround, horizontally just below the left eye. Biopsy: "typical rodent ulcer" (fig. 1). A lotion of equal parts of saturated solution of sod. bicarb. and glycerin produced a little erythema, but the ulcer was healed on July 29. Slight redness persisted till August 19. The scar can be found only on close examination.

4.—Mr. D., aged 62, was seen on Jan. 17, 1939. Two years previously a sore had developed in the left posterior triangle of the neck (fig. 2). At first it was pustular, and several times it broke down and then healed. Examination showed a shallow ulcerated area ($1\frac{1}{4} \times \frac{3}{4}$ in.) with a waxy edge (fig. 2*a*) The skin in the centre showed scarring and several small crusted points. Biopsy: "rodent ulcer" (fig. 3). Dressings with a solution of sod. bicarb. with glycerin continued till June, 1939, when healing had taken place. Subsequently sebaceous exudate occurred, but a little lotion applied at intervals removed this. In August, 1942, the patient was admitted to the ward so that simple watery solution might be applied

Fig. 3—Case 4: rodent ulcer

regularly to get rid of the exudate completely. This was successful (fig. 2*b*), but a small ulcer with sebaceous exudate has since appeared at the bottom of the scar.

5.—Mrs. F., aged 73, seen on Feb. 16, 1939, had a rodent ulcer on the tip of the nose just left of the mid-line ($\frac{3}{8} \times \frac{1}{4}$ in.). It had been present for 18 months and had broken down and crusted over several times. Biopsy: "rodent ulcer." Under treatment with equal parts of saturated solution of sod. bicarb. and glycerin the lesion had healed by March 14. The patient was confined to the house for the month of May and on first going out was exposed to hot sunlight. The site of the ulcer blistered and broke down. Dressings with paste and lotion were resumed and healing finally took place on Dec. 12, 1939. The site has remained firm since.

6.—Mrs. G., aged 43, was seen on July 16, 1940, with a slightly itchy circinate raised tumour of $\frac{3}{8}$ in. diameter, with a pearly edge and some central scarring on the nose close to the inner canthus of the right eye. It had started as a papule three years previously and had at one time been cauterised with silver nitrate. Biopsy: "early basal-celled carcinoma. This is not a typical rodent ulcer but is midway between rodent and epithelioma" (fig. 4). A paste of gr. 240 sod. bicarb. in $\frac{1}{2}$ oz. each of glycerin and water produced some erythema. An ointment of 30% sod. bicarb. in lanolin was then used but had no obvious effect, so a lotion of equal parts of saturated solution of the sodium salt and glycerin was applied. The lesion had healed on May 20, 1941, and a smooth, flexible scar remains.

7.—Miss H., aged 72, seen on Jan. 3, 1941, had a circinate scaly ulcer of $\frac{3}{4}$ in. diameter with an unbroken surface. It had been present for about two years. Biopsy: "rodent ulcer." It was treated with a 30% bicarbonate in soft paraffin and later with lotion. A rolled edge was evident in September, so the patient was sent for radium treatment. On Oct. 31 four 1 mg. needles were inserted under local anæsthesia. She was discharged from hospital on Nov. 7 and healing was uneventful.

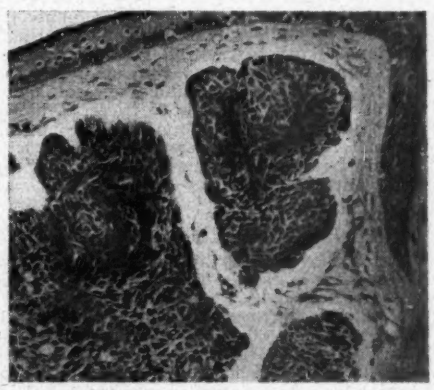


Fig. 4—Case 6: midway between rodent ulcer and epithelioma

8.—Mr. I., aged 74, seen by me on Dec. 20, 1941, had a rodent ulcer (2·6 × 1·7 cm.) on the right temple. It had been present about two years. The postero-inferior part

showed the typical rolled edge while over the surface there were small shallow ulcers with yellow sloughs. Five months previously, radium needles had been inserted and left in for a week. As healing had not taken place the advice of the radiotherapy consultant for the area was sought, and he referred the case to me. I admitted the patient to the ward so that a simple saturated solution of sodium bicarbonate in water could be applied often enough to keep the dressing moist. There was no visible or subjective reaction. Healing was complete on Feb. 1, 1942, and a firm smooth scar remains.

9.—Miss J., aged 81, seen on Oct. 20, 1942, had an ulcer on the right cheek of 3½ years' duration. Biopsy: "ulcer has the general appearance of a rodent but there is a differentiation of the epithelium with the production of early epithelial whorls. I think it should be considered as epithelioma." Except that on two occasions the skin around the ulcer became irritated by the bicarbonate lotion and had to be soothed by calamine lotion, progress was uneventful. The lesion was soundly healed on Jan. 18, 1944—one pinhead of crust only being present. In July she showed only a smooth scar.

10. Mr. K., aged 47, noticed a papule on the right side of the nose near the inner canthus of the right eye about a year before he was seen on April 5, 1943. Examination showed a circular bossed lesion of ¼ in. diameter with a central crust. Biopsy: "rodent ulcer." A lotion of two parts of saturated solution of sod. bicarb. and one part of glycerin was prescribed. The ulcer was healed on Dec. 14, 1943.

11. Mrs. L., aged 65, first attended on Oct. 16, 1943. For two months she had had an ulcer on the right malar region. Nine years previously there had been a boil at the same place and later a burn from fat. The lesion measured 1 × ¾ in. Biopsy: "carcinoma of squamous origin, though it may have arisen as a rodent." Under the usual bicarbonate lotion the ulcer became cleaner, shallower and smaller, but the skin around became reddened and thickened. I asked Mr. C. J. L. Thurgar, the radiotherapy consultant, to see the patient on Jan. 12, 1943, and he advised a soothing application—2% ichthyol in Lassar's paste was used. The thickening and redness settled in a week and the ulcer had healed without further bicarbonate treatment by Jan. 27, 1944.

SUMMARY

The treatment of rodent ulcer by local application of sodium bicarbonate is described.

Under this treatment the lesion disappeared in 8 out of 16 uncomplicated rodent ulcers which were verified histologically.

I gratefully acknowledge the help of Dr. J. Steven Faulds, pathologist to the Cumberland Infirmary. He has made all the biopsies and photomicrographs for me and also took photographs of patients My thanks for photographs are also due to Surgeon Lieut. R. Kilgour, a former house-physician, and to Sgt. J. Kerman of the Carlisle city police.

Reviews of Books

A Textbook of Psychiatry

For Students and Practitioners. (6th ed.) D. K. HENDERSON, MD EDIN, FRCPE, R. D. GILLESPIE, MD GLASG., FRCP. (Humphrey Milford. Pp. 719. 25*s*.)

EACH new edition of this textbook testifies to its success and to the care the authors take to include in it the results of recent work. Besides numerous passages added for the latter reason, there are in this sixth edition some major rearrangements and a special chapter on methods of physical treatment. The section on paranoid states has been moved from the schizophrenic reaction types because in the authors' experience the personality of paranoid patients is not in keeping with this attribution, and complete final disintegration of the personality is almost consistently absent. (For so bold a statement detailed evidence would be desirable: many psychiatrists would say their experience led them to a contrary conclusion.) The chapter on psychiatry in the last war—always an odd excrescence in an otherwise systematic presentation—has been amplified by data from the present struggle: it would probably be an advantage if in the next edition the authors could distribute this material in the appropriate sections, in accordance with their general scheme. It would also enhance the value of this compendious book if the interesting chapter on relations of psychiatry and law could be made fuller: such important work as that of Norwood East, the Gluecks, Ashaffenburg, and Vervaeck, covers ground that it would be valuable to traverse, however briefly. Room could perhaps be found for it by pruning some of the material, up and down the book, that is now of historical rather than current interest ("antedating," for example).

Meaning and Purpose

KENNETH WALKER, FRCS. (Cape. Pp. 170. 7*s*. 6*d*.)

LULLED by the rhythm of Mr. Walker's smooth pen, his reader is in danger of acquiescing in almost anything he says: especially a reader who has enjoyed his *Circle of Life* and *Diagnosis of Man*. All the same, after a chapter or two of this book, he may become uneasy. Mr. Walker says in his preface that he has examined critically "those scientific theories of the last hundred years which have exerted a strong influence on our thinking, not so much for the purpose of assessing their worth as for discovering the effect which they have had on our philosophy of life." In fact, he has gone farther, for besides reviewing the influence of Darwin, Bergson, Freud, and others, he has added chapters on "the religious account of reality," "the worship of race" and "the religion of communism." He is anxious to show us where the materialists have gone wrong, and since this is a short book he has to hurry through their positive contributions to knowledge in order to attack their weaknesses. The result is unfair to Mr. Walker, for it gives an impression of bias which may rouse the old Adam in his more aggressive readers. Like Mottram in *The Physical Basis of Personality*, he makes the point that science has set itself to study, by means of the senses, what we think of as the material world: and he, too, holds that in addition to the senses we have a faculty of direct perception with which science naturally has nothing to do. With this proposition many will agree; but he is probably right in thinking that it is less acceptable to the young than to the more experienced. In his kindly anxiety to draw from his own development the morals which will help contemporary young through their growing pains he tends, however, to forget the meaning and purpose of growth. The mind cannot be fully accessible to the forces which will move it twenty years hence, or which moved it twenty years ago. Just as the skeleton in which the epiphyses unite before their time is pathological, so the mind in which opinions are formed early and maintained for life has suffered arrest.

If Mr. Walker is content to have stimulated new lines of thought in his reader and revived the vigour of old ones, he has written a successful book. If, like the young clergyman, he wanted to preach a sermon which would put us all right he has failed. Perhaps he worries too much. Among men belief and practice seldom go hand in hand: the medieval church combined a positive and practical belief in mercy and charity with the burning of heretics. The young who believe "that science is capable of providing all they need, and even a metaphysic" are often incurably altruistic.

A Life of Travels

C. S. RAFINESQUE. (Waltham, Mass: Chronica Botanica Co. London: Wm. Dawson and Sons. Pp. 57. $2.50.)

THESE autobiographical notes, which were published in 1836, have been reprinted as a number of *Chronica Botanica*, with a foreword by Elmer D. Merrell, and make interesting reading. The son of a French father and a Greek mother resident in Turkey, Rafinesque spent a wandering childhood and adolescence in various parts of Europe, and was attracted early by the study of botany and zoology. After three years in America he settled in Sicily for ten years, combining commerce with biological research, founding the squill industry, and publishing many scientific papers. In 1815 he migrated to America with a vast collection of specimens which were lost by shipwreck. From then until his death in 1840 he travelled extensively in that country, and for some years was professor of natural history at Lexington. This work is an epitome of his journal and contains no technical matter; it is of interest as a record of travel and of a varied and somewhat tempestuous career.

THE LANCET
LONDON: SATURDAY, DECEMBER 2, 1944

The Example of New Zealand

As the time draws closer for formal negotiation between the medical profession and the Government, each feasible alternative to the white-paper plan is brought into the open. Some, poorly rooted, wither at once in the noonday glare, but others survive and flourish—at any rate temporarily. What at present looks like the hardiest plant comes from New Zealand. More and more is being heard about the social security schemes enacted in that Dominion, and opinions differ as to whether we are to take New Zealand as an example or as a warning. Unfortunately, much of the current discussion has been based on old facts, and in the hope that fresh data may be helpful we are publishing, this week and next, an article based upon the most recent information to reach this country.

Like our own National Health Insurance Act, the New Zealand Social Security Act gives doctors the choice of several methods of remuneration. But whereas over here payment by item of service never found much support, in New Zealand it is now used more than any other. In Britain only two areas (Manchester and Salford) elected to pay panel doctors on this system, and they both abandoned it after years of uneasy trial—years in which they vainly sought means to keep it free from abuse and fair both to patient and doctor. When it failed, Manchester and Salford turned instead to payment by capitation fees, which was already adopted by every other area. It is all the more surprising therefore to find that in New Zealand the capitation system has relatively few advocates, and that more than nine-tenths of the payments to doctors are made through payment-for-service or refund systems. For basically the refund system is a system of payment by item of service, even though some claim that the fact that the doctor usually charges the patient a small fee, above and beyond that allowed by the State, is a deterrent to abuse, preventing frivolous demands by the patient and over-attendance by the doctor. This extra fee is, however, an optional addition, and apparently, being unpopular with the patient and incapable of legal enforcement, it is often waived; so there is a tendency for the State-allowed fee to become the standard payment. If New Zealand abides by this system, she will some day have to find a solution for problems which we failed to solve here—how to reward the able and conscientious doctor who may make fewer but more useful attendances than his less efficient or less scrupulous colleague, and how to ensure that the social security funds are not threatened with bankruptcy by claims for an ever-increasing number of items of service. At present, in New Zealand, these funds are able to meet all calls on them, with relatively little subsidy from general taxation; but this is only so because of war-time prosperity, which ensures a high yield from the wages tax by which the fund is raised, and a minimal call on the fund for the relief of unemployment. There is also in New Zealand today, as here, a great shortage of civilian doctors. Most doctors are working to capacity to do the minimum essential work, and there is little temptation to excessive attendance, or even opportunity for it. This fact is reflected in the comment in the annual report of the New Zealand Director-General of Health, which has just reached us, in which he says, "The shortage of civilian doctors and the long hours they are working in many cases makes it unlikely that the cost of general medical services will increase further under present conditions."

This comment also suggests that the New Zealand government are uneasily aware of the magnitude of the potential commitments they have undertaken, and supports the view, expressed in our article, that not very long after the war they may have to press for alteration in the methods or scales of payment. Time alone can show with what success our New Zealand colleagues would be able to resist such a demand. But, theoretically, it does not seem that they have placed themselves in a strong position vis-à-vis their government. Instead of taking the attitude, now likely to be adopted by doctors in this country, that first and foremost, in any negotiations for a new medical service, must be placed the achievement of a sound administrative structure giving the profession its proper share of influence and responsibility, the New Zealand profession has allowed itself to undertake piecemeal, and without coördination or safeguard, the provision of all those parts of a national health service for which the Government could be induced to offer immediately satisfactory terms. Doctors in the Dominion now have little or no say in the planning or administration of the service. The few advisory committees allowed for by the Social Security Act are appointed by the minister of health himself, and have functions similar to committees familiar to us through National Health Insurance, such as the allocation and medical-services sub-committees; they exist, in other words, to facilitate the day-to-day working of the Act, and not to influence future policy. The New Zealand minister may also, if he chooses, recognise "any committee or other representative body for the time being constituted to promote or safeguard the interests of the members of any profession affected by the operation of the Act" as a suitable body with which to discuss terms and conditions of service. Apart from this, the only professional voices he hears are those of the permanent salaried doctors employed in the department of health.

We cannot help feeling that, in the shaping of the New Zealand scheme, opportunities have been missed that might have resulted in a really comprehensive plan, offering, to doctor and patient alike, a fuller, a better, and a more progressive service. All that has so far been secured is a State subsidy of private practice, and this by an extravagant and easily abused system, which, experience has shown, fails to encourage or reward the highest standard. As such, it is unlikely to give lasting satisfaction either to the profession or to the people of New Zealand. We venture to hope that, when the time comes for its revision, we may have raised a structure here, in our own new service, that will provide a worthy and acceptable pattern for New Zealand to copy, or to adapt to her own local needs.

Protection from Hepatitis

THE widespread increase of jaundice in the past few years has stimulated research; but in discovering new facts we have, as usual, discovered new problems. Three varieties of hepatitis with jaundice are now recognised: infective hepatitis (formerly called catarrhal jaundice), postarsphenamine hepatitis, and homologous-serum hepatitis. It is virtually certain that infective hepatitis is due to an infective agent, but this has not yet been identified and we do not know how it is ordinarily conveyed. The relationship between the three types of hepatitis is likewise obscure, though suggestive facts are accumulating. The evidence for their unity is about as strong as the evidence for their separate identity; but DIBLE, MCMICHAEL and SHERLOCK [1] have at least made it clear that all three have essentially the same pathological background—namely, a variable degree of cytolytic change in the liver with cellular infiltration of the portal tracts. The old conception of duodenal or biliary catarrh, with inflammatory blockage of the bile-ducts, has been abandoned, and attention is focused on the liver cell as the principal point of attack. Hence it is natural that attempts should be made to detect weaknesses in the defences of the liver against toxic agents and to find means of protecting it.

DAVIS and WHIPPLE [2] in 1919 showed that feeding with carbohydrate protected the liver against chloroform injury. MESSINGER and HAWKINS [3] in 1940 indicated that a diet of high fat content lowered the tolerance of the liver cell to arsphenamine, while protein was protective. Until recently it has been usual, in treating hepatic disorders, to ensure an adequate intake of readily available carbohydrate and a low intake of fat; but evidence of the positive importance of dietary protein has been increasing. Animal experiments (SHIFRIN,[4] GOLDSCHMIDT et al.,[5] MILLER and WHIPPLE [6]) have shown that protein feeding guards the liver against injury by arsphenamine and chloroform, and it appears that on diets low in protein the cytoplasm of the liver cells diminishes (KOSTERLITZ.)[7] It is noteworthy that ANDERSEN of Copenhagen,[8] when transmitting infective hepatitis to pigs and from pig to pig, found that the disease affected only the undernourished. The protective action of protein may be explained by the presence in the protein molecule of thiols—the sulphur-containing amino-acids methionine and cysteine—which combine with, and detoxicate, many organic arsenical compounds. This explanation is feasible in the case of arsphenamine hepatitis, if we assume that the liver is damaged when the stores of detoxicating amino-acids are exhausted. But in infective hepatitis one would not expect these amino-acids to confer much protection against the unknown infecting agent, unless methionine and cysteine play a larger part in guarding the liver cells against injury. It is now known that a variety of abnormal diets will give rise to cirrhosis of the liver in animals, and HIMSWORTH and GLYNN [9] have described a form of hepatitis produced in rats by a protein-deficient diet (trophopathic hepatitis), against which complete protection is given by adding methionine to the diet. GOODELL et al.[10] found that methionine prevents arsphenoxide injury in dogs on a diet deficient in protein. In man BEATTIE and MARSHALL[11] found that, in syphilitics receiving neoarsphenamine, administration of amino-acids did not reduce the "overall" incidence of liver damage, but (methionine especially) shifted its peak incidence towards the end of the second course of antisyphilitic treatment and reduced its severity.

A carefully controlled investigation has been made by PETERS et al.[12] on the effect of casein, cysteine and methionine in the treatment of hepatitis arising in the course of arsphenamine therapy, and from the results they conclude "that both cysteine and methionine had a significant but not remarkable effect on the course of the jaundice," while casein had none. Their findings confirm the clinical impression that cysteine and methionine have a definite though not sensational effect on the disorder. It should be noted, however, that their criterion of improvement was reduction in bilirubinæmia; and jaundice is only one of several signs of disordered liver function. Further, it is a matter of common experience that subjective improvement precedes the disappearance of icterus by days or weeks; so it is possible that a beneficial action on the liver cell might not immediately lead to diminution of bilirubinæmia. In another series of experiments BEATTIE[13] has studied the effect of variation of protein intake on the progress of infective hepatitis and postarsphenamine jaundice, and has found that by increasing the daily ration of protein to as much as 150 grammes the average stay in hospital can be reduced by more than a third. He further states that "the average time spent in hospital in a large series of cases is roughly inversely proportional to the daily protein intake." In assessing the therapeutic value of methionine and cysteine, he emphasises the necessity of taking into account the protein content of the diet; for a diet poor in protein may annul or minimise the benefit from the amino-acids, and conversely a diet rich in protein tends to reinforce their action. If, however, methionine and cysteine act in a specific manner in hepatitis it would probably be more important and simpler, when the quality of the diet is in doubt, to increase the dose of these amino-acids so as to outbalance any effect of protein deprivation.

Further work on these lines, especially if it takes into account other functions of the liver, should be fruitful. The present stage of the investigation of hepatitis is fascinating and full of promise, but while attempts to assign specific rôles to individual amino-acids are necessary, it may be wise to keep in mind a principle of general dietetics—that a good mixed diet tends to meet the requirements of the average person. Remembering the intimate interrelationships of the

1. Dible, J. H., McMichael, J., Sherlock, S. V. P. *Lancet*, 1943, ii, 402.
2. Davis, N. C., Whipple, G. H. *Arch. intern. Med.* 1919, **23**, 612.
3. Messinger, W. J., Hawkins, W. B. *Amer. J. med. Sci.* 1940, **199**, 216.
4. Shifrin, A. *Virchows Arch.* 1932, **287**, 175.
5. Goldschmidt, S., Vars, H. M., Ravdin, I. S. *J. clin. Invest.* 1939, **18**, 277.
6. Miller, L. L., Whipple, G. H. *Amer. J. med. Sci.* 1940, **199**, 204.
7. Kosterlitz, H. W. *Nature, Lond.* 1944, **154**, 207.
8. Andersen, T. T. *Acta med. scand.* 1937, **93**, 209.
9. Himsworth, H. P., Glynn, L. E. *Lancet*, 1944, i, 457.
10. Goodell, J. P. B., Hanson, P. C., Hawkins, W. B. *J. exp. Med.* 1944, **79**, 625.
11. Beattie, J., Marshall, J. *Brit. med. J.* Nov. 18, p. 651.
12. Peters, R. A., Thompson, R. H. S., King, A. J., Williams, D. I., Nicol, C. S. *Nature, Lond.* 1944, **153**, 773.
13. Beattie, J. Royal College of Surgeons of England, Scientific Report, 1943–44, p. 19.

amino-acids, and the importance of even simple members of the series like glycine in detoxicating mechanisms, one may look forward hopefully to influencing the liver cell by employing selected groups of these compounds.

VD

VENEREAL diseases are commonly called "scourges," and many people still think of them chiefly as a reward of sin. It is refreshing to find that in Colonel GORDON'S lecture, published in our present issue, the control of these diseases is discussed on stark epidemiological lines. No doubt it is still premature in this country to presume a state of public enlightenment that would permit the medical officer of health to control their spread in the same way as he controls the spread of diphtheria or typhoid fever; but a great deal has been done in the past two years by the Ministry of Health and its allies to break down the old attitude of "secrecy and hush-hush." This attitude, said Sir WILSON JAMESON in his recent broadcast, "has not been entirely overcome, but it has suffered a resounding defeat." He rightly added: "we must have the support of well-informed public opinion."

It is interesting to hear from GORDON that the US medical authorities in the European theatre of operations have decided that gonorrhœa can be diagnosed on the basis of history, clinical symptoms and physical signs, and that demonstration of the causative organ, while desirable, is not essential. We wonder what the clinic medical officers who examine reported contacts under regulation 33B would think of this. Reliance on symptoms and signs can only be satisfactory, surely, if the vast majority of cases of urethritis are caused by the gonococcus; and the experience of British Service venereologists suggests that they are not. Most specialists in the subject here have come to regard primary non-specific urethritis as a clinical entity, though it may be often venereal in origin. A substantial proportion of the cases of urethritis attending Service treatment centres show a longer incubation period than is usual for gonorrhœa and do not in general respond to sulphonamides or penicillin. In such cases a certainly causative organism is rarely isolated and some workers have thought that a virus may be the responsible agent. If this form of venereal disease is really non-gonococcal, it seems probably best to report it as such.

For the prevention of gonorrhœa chemotherapeutic prophylaxis—or post-prophylaxis—is undoubtedly effective: the disease is less likely to materialise if sulphonamides are taken a few hours after a risk of infection. If, however, the strain of gonococcus concerned happens to be sulphonamide-resistant this result cannot be expected, and the risk of actually manufacturing a resistant strain is not negligible. There is also a small risk of sensitising people by giving them little doses of sulphonamides. American investigators put the incidence of ill effects attributable to idiosyncrasy at less than 4% for cases treated with prophylactic sulphathiazole, but even this proportion cannot be ignored. Dizziness is the commonest subjective symptom, and it is obvious that incoördination of inappreciable degree might spell disaster to a pilot or driver. We must ask ourselves whether, when penicillin is available for treating gonorrhœa, it will still be justifiable to employ even a slightly hazardous means of prophylaxis.

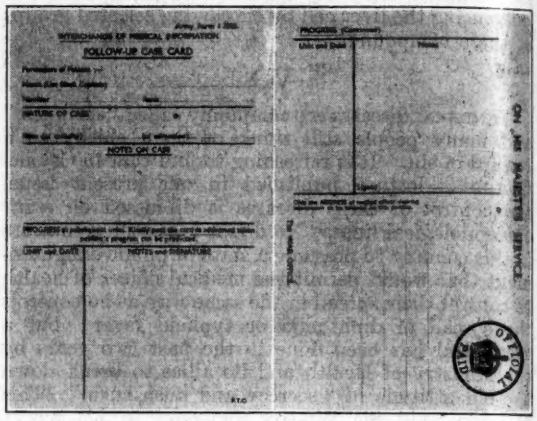
While we heartily agree with GORDON that the provision of adequate treatment facilities is an essential part of any control programme, and that these facilities should be integrated with those of a general hospital, it seems important that the responsible physician should be one who is making the subject his life's work and not one who is pot-boiling or waiting for something better to turn up. Patients are quick to recognise the specialist with divided interests and his clinic seldom prospers. The efficient treatment of venereal diseases will be one of the tasks of any National Health Service, and we may suppose that in each area or region an experienced consultant will hold a senior post. Wherever possible this consultant should be on the teaching staff of a medical school where he will direct his own clinic, teach students, and be in a position to pass on his knowledge to those in charge of smaller clinics in his region. He would also organise the training of clinical assistants, nurses, male orderlies and social workers at his central clinic, from which they would "graduate" to responsible posts. From this system a certain uniformity of standards should emerge which is the opposite of what obtains today in any half-dozen clinics in a given area. Demobilisation will release enough keen VD specialists to supplement those already available, and it will be a national loss if these are allowed to drift into the various walks of medical life where their special experience will be of little use.

Finally, when demobilisation comes, it should not be difficult, with adequate supplies of penicillin, to ensure that men and women are not discharged from the Services in an infectious state. Speaking of demobilisation in the United States, the Surgeon-General of the US Public Health Service said on Nov. 9 that it will create a sanitary oasis of 10–12 million men returning to their homes healthy or in a non-infectious stage of disease. But, in the British Forces at any rate, this must be arranged without any penalisation, for demobilisation cannot be deferred on account of a venereal infection. Such men and women as need further treatment or surveillance will, as happens now in invaliding from the Services, be directed to the civilian clinic nearest their homes and provided with a written account of their treatment to date for the information of the clinic doctor. It has been suggested that the name of the patient might be sent to the medical officer of health of the district to ensure that his case is followed up; but, tempting as this proposal may be, it would smell of discrimination against the Forces. The post-war reservoir of infection will not be among ex-Service men and women, whose disease has been systematically treated and among whom default has generally not been possible, but among the thousands of civilian sufferers, some of whom have never submitted themselves for examination and many of whom have not completed treatment.

Sir JOSEPH ARKWRIGHT, FRS, honorary bacteriologist to the Lister Institute, and till 1940 a member of the Agricultural Research Council, died on Nov. 22 in his 81st year.

An Appeal from the Field

NOT more than one of every hundred follow-up cards sent with their patients by surgeons of the British Liberation Army is getting back to the sender. The forward surgeon who wants to know whether his technique needs modification, or is collecting a series for publication, fills in his patient's particulars on the follow-up card here illustrated (Army Form I 3216), addresses it to himself, and encloses it with the man's case-notes before evacuation. Each unit through which the man passes makes a note under "Progress," until the time arrives when the outcome can be predicted with reasonable certainty; a final note is made by whoever is then in charge of the patient; and the card is posted back (at Government expense) to the forward surgeon. With the MEF and CMF this system worked well, but for some reason it is not working between the Army hospitals in France and Belgium and the hospitals in England. In his letter on another page General MONRO implies that large numbers of cards are put into circulation; this means that some get lost on the way, for many EMS surgeons have rarely or never seen one; others fail to make the change-over from Army to EMS dossier; sometimes the surgeons at the base may forget them at a busy time, for the casualty work has fallen heavily on relatively few. Moreover, the instructions may not point definitely enough to one man as the person to return the card; better results might come if the forward surgeon stipulated the date for return, varying the length of time with the case—3 weeks for an abdomen, 3 months for a fracture, and so on.



Follow-up Card.

This is not "just another Army Form"; it is a personal request from a colleague, who cannot see the result of his work, for news of his patient. It should have a high claim on the surgeon's time.

Annotations

DIFFUSION OF SULPHONAMIDES INTO WOUNDS

WHEN sulphonamides are inserted into a wound they may be distributed around the cavity by currents in the fluids of the wound, but it is doubtful whether these are sufficient to carry them into the deeper crevices; they may penetrate dead tissue slowly by diffusion, but their action does not penetrate far into living tissues, owing to the equalising influence of the circulation in the capillaries.[1] Accordingly it is useful to consider what concentrations may be obtained in the wound by giving the compounds by mouth. Cope[2] compared the level of sulphadiazine in the blood and vesicle fluid of patients with burns. In one patient, treated within 2 hours of the injury, the concentration in the vesicle fluid was the same as in the blood—4·3 mg. per 100 c.cm. In another patient, who had not been treated until 60 hours after the burn, the concentration was 3·3 mg. in the vesicle fluid and 8 mg. in the blood. Much depends in such observations on whether the concentration in the blood is rising or falling at the time the sample is taken, for the amount of sulphonamide in the wound fluid (or tissue) requires time to come into equilibrium with that of the blood, and a considerable lag may occur. Lately Sager and Pudenz[3] have made experimental wounds in guinea-pigs, treated the animals by mouth with sulphonamides for 48 hours, and compared the concentration in the blood and wound exudate. In guinea pigs treated with sulphadiazine or sulphanilamide the concentration in the exudate was on the average 1½ to 2 times as high as that in the blood—e.g., with sulphanilamide 2·6 mg. per 100 c.cm. in the blood and 5·0 mg. in the fluid; with sulphadiazine the average figures were 5·7 mg. per 100 c.cm. in the blood and 8·7 in the fluid. With sulphathiazole, on the average, the concentration in the exudate was only about three-quarters that of the blood. An examination of their figures however shows that there were great variations in the individual cases. Sometimes the concentration in the fluid was much greater than in the blood, occasionally it was lower. The differences in the concentrations in the exudate and in the blood may be partly due to the complex nature of blood. The sulphonamides are distributed unequally between the corpuscles and the plasma, and it is only the sulphonamide in the plasma which is in relation to that of the exudate. Moreover, in both fluids much of the sulphonamide is not free to diffuse but is bound to the plasma.[4] The concentration will also be influenced by the relative acidity or alkalinity of the two fluids, for this greatly influences the solubility of the compounds. For practical purposes, small variations in concentration, whether in exudate or blood, are probably unimportant. If an organism is not controlled by 5 mg. of sulphadiazine per 100 c.cm. it is not likely to give much response at 8·7 mg. It is enough to say that the concentration in the exudate is about the same as that in the blood. This agrees with the results of earlier workers on other body fluids, who found that after oral administration the concentration in peritoneal, pleural and joint effusions tends to be somewhat lower than that of the plasma when equilibrium is reached, which takes 2–3 hours.[5] Similarly the concentration of sulphathiazole in the fluid of the knee-joint is about the same as in the blood.[6]

All this indicates that the concentration of sulphonamides in wound fluids after oral administration is not negligible; but it is much lower than that which can be produced by inserting the compound directly into the wound. Each method of administration has advantages and disadvantages; the logical procedure is to combine them so as to summate the advantages and minimise the disadvantages.

1. Hawking, F. *Lancet*, 1941, i, 786.
2. Cope, O. *Ann. Surg.* 1943, **117**, 885.
3. Sager, W. W., Pudenz, R. H. *Nav. med. Bull., Wash.* 1944, **42**, 1275.
4. Davis, B. D. *J. clin. Invest.* 1943, **22**, 753.
5. Canterow, A., Cubberley, C. L., Ratcliff, A. E. *Arch. intern. Med.* 1942, **69**, 456.
6. Heyl, J. T. *Proc. R. Soc. Med.* 1941, **34**, 782.

RÔLE OF THE MOH

How can the medical officer of health best employ his knowledge to promote health? Prof. R. M. F. Picken, in his presidential address to the Society of Medical Officers of Health on Nov. 17, asked and answered this question. He recalled that when he joined the society in 1912 many MOH's were in general practice, their public work being part-time; and he was then impressed by the range of their observations, and by their excursions into what is now called social medicine. These doctors "were among the few who had ready access to the facts bearing on communal health and they had time to study them." It was not long, however, before the growth of the personal health services changed the duties of the MOH and laid on him a great burden of administrative work. It is well, Picken thinks, that local authorities should place the management of professional and technical departments in the hands of professionals; but if a medical man allows himself to be engrossed in administrative detail, he loses touch with the medical thought that ought to mould the growth of his department. If he has to depend on others for medical advice, then he strengthens the case of those who believe that the head of a health department need not be a doctor at all. No MOH, in Picken's view, should be expected to fill his every working hour with routine duties: even while a junior, he should have time to get to medical meetings and time for reading. Nor should he have to set a limit to the field of medicine he surveys in relation to the people he serves.

Already the MOH has a claim to be regarded by his colleagues as a specialist: he holds a higher qualification and he has special opportunities for studying, for example, nutrition and infectious diseases. To make the best use of these opportunities he will be wise, in Professor Picken's opinion, to concentrate on the statistical material at his command, which often enables him to throw light on the relations between health and environment. The earlier medical officers of health did well in this field, but nowadays professional statisticians have scared many a good man from figures. This is a pity, for the MOH with an eye for the information to be gained from numerical data—both local and national—can make contributions at least as valuable as those of any other specialist.

REVIVING THE DEAD

DEATH is a relative term. To the doctor, it means the cessation of respiration and circulation. To the biological purist it means a complete cessation of function of all the organs of the body. A considerable time interval usually separates these two states. As far as we know, biological death is irrevocable, but clinical death is by no means always so, if the precipitating cause of death is transitory. We have learnt from animal and human observations however that the higher functions of the brain are irretrievably lost if their oxygen supply is stopped for more than a few minutes. For recovery therefore oxygenation and circulation of the blood must be restored within this period. It may be possible to restore pulmonary ventilation by artificial respiration or intratracheal insufflation; and cardiac massage, which directly stimulates the heart to contract, also mimics the pump effect of the heart in forcing oxygenated blood into the coronary and carotid arteries. Intravenous blood-transfusion alone is valueless when the heart has stopped, since it cannot develop enough pressure to push the fluid through the lungs and heart and into the arterial tree. Enthusiastic reports now come from Russia of a simple but theoretically well-founded technique of resuscitation. Transfusion of blood into an artery is started as soon as possible after the heart has stopped, certainly within five minutes. If the injected blood is introduced at a pressure of 160–200 mm. Hg the aortic semilunar valves close and the blood is forced into the coronary arteries and the peripheral arterial tree. Artificial respiration is carried out simultaneously by intratracheal inflation of the lungs with bellows. An ordinary intravenous blood-transfusion is begun directly after the heart has started pumping normally. As would be expected, success has been attained only in otherwise healthy subjects who have "died" as a result of trauma—usually from hæmorrhage. The brief reports so far available[1] give no details of the successes, but of the 51 men revived, 12 recovered completely and were evacuated to base hospitals.

HOME AND FOSTER-HOME

NEGLECT of children is not a pleasant subject, and this is one reason why it gets little attention. Dr. A. E. Martin,[2] senior assistant MOH for Leicestershire, believes that, so far as the neglected child is concerned, evacuation, whole-time work in factories by mothers, separation of parents, and similar circumstances, have more than counterbalanced the decrease in poverty during the war. The bodies mainly dealing with the problem are the National Society for the Prevention of Cruelty to Children and the health and education departments of the local authorities; but few authorities have any unified scheme of administration and no public body has a statutory duty either to seek out or to alleviate cases. Martin contends that almost every case should be discovered by either the health or education services, but lack of any coördinated plan has meant that many children needing help have not had it. He recommends that some member of the central staff of the health authority should be available to receive reports, to give advice, and to devote part of his time to the administration and supervision of a definite scheme. Probably this task would be undertaken by an administrative medical officer, and much of the success of the scheme would depend upon the energy and enthusiasm of him and his colleagues.

Neglect may be due to the parents being ignorant and incompetent, or wilful or thoughtless. In the less serious cases much can be done by the visits of health visitors or trained social workers, but where neglect springs from graver causes a different line of approach is called for, and coöperation with the NSPCC may prove valuable. Prosecution is rarely desirable unless it becomes evident that the only way to protect the child is to remove him from the care of his parents. Even bad cases of neglect are found among parents just as affectionate as the average but lacking the mental ability to keep up a reasonable standard of living. It may be necessary to remove the children in their own interest, but such parents should not be penalised as if they were deliberately cruel, and the disposal of the child should be carefully considered beforehand. Nothing is gained by lodging him, even temporarily, in an environment which the parents have grounds, whether real or fancied, for thinking worse than his own home. The recent case where a child was placed for a short time in a remand home showed how strong feeling can be on this point.

In the same way, much thought should be given to choosing the right places for any other children brought up away from their homes. The Provisional National Council for Mental Health has published a pamphlet[3] setting out well the principles that should guide those responsible. The homeless child needs the same things as any other child—security, individual love, and a chance to develop his initiative. He may get all these

1. *Soviet War News*, 1944, no. 982, p. 3.
2. *Public Administration*, 1944.
3. "The Care of Children Brought Up Away from Their Own Homes." From 39, Queen Anne Street, London, W1.

things in the right foster-home, or in a home for a group of children provided he and the superintendent suit each other. When children are grouped together under the care of one person—or preferably two people, man and wife—the family pattern should be copied as closely as possible, children of varying ages being included. Such an arrangement gives the older ones practice in looking after the smaller children, and the smaller children a chance to learn from their elders. Repeated changes of home or foster-parent are bad for children, destroying all sense of security: for this reason the first choice of home must be made very carefully. As we noted in our article on Unwanted Children on Sept. 23, the idea of the regimented orphanage is fortunately disappearing. Its end might be hastened by the appointment of Commissioners in Child Welfare as suggested by Captain Daynes in our correspondence columns this week.

FULL EMPLOYMENT

FEW would dispute that unemployment is a major cause of physical and mental ill health, or that, in Britain at any rate, full employment might prevent more disease than any immunological procedure. The devices whereby this powerful prophylactic can be brought into action are social and economic rather than medical, but we make no apology for giving space this week in our Reconstruction column to a review of the second Beveridge report which discusses the foundations of national welfare. The sciences of economics and sociology are still in swaddling clothes; their techniques are such that most who run may still read; and their vocabulary is not beyond the understanding of the liberally educated. The doctor who, wittingly or otherwise, practises social medicine, may feel inclined to consider the means by which Sir William Beveridge believes we could improve the daily life of millions.

LONDON AND NEW YORK

IN the last few years the attitude of the profession towards infant mortality has become less fatalistic, and there has been a welcome tendency to make geographical comparisons as well as temporal ones. Before the war the practice of looking back at the high mortality of 40–50 years ago was apt to induce complacency. Certainly we need not be ashamed of the decline since those days, but we still do not know whether it is chiefly due to improvement in the care and surroundings of the newborn, or to an equally dramatic restriction in the size of families.

Sir Allen Daley's annual report for 1943 as medical officer to the London County Council shows that infant mortality in the county fell from 159 per 1000 live births in 1900 to 51 in the year under review; but it also makes some instructive comparisons with the corresponding rates for New York. Strictly, it would have been more appropriate to use the rates for Greater London, as Stocks did,[1] so as to bring in the suburbs, which offer a more favourable environment for health than London County; but their exclusion does not distort the general picture. In New York infant mortality declined from 135 in 1900 to 30 in 1943—a fall of 78% as compared with 68% for London. The decrease has therefore been much more pronounced in New York than in London, especially since 1935 when the two rates stood at 48 and 58. When the difference between the 1943 rates for the two cities is broken down it is seen that the bulk of the London excess occurs at 1–12 months, when a New York death-rate of 8·7 contrasts sharply with one of 27·3 for London. This difference is not by any means explained by the effect of war conditions on infant health; it was just as plainly apparent in the 1930's despite New York's more difficult climatic and racial problems. Two-thirds of the difference in the death-rates for the whole 12 months is accounted for by two groups of diseases—gastro-enteritic and respiratory. If London could equal the New York rates in these groups Daley would be able to report an infant mortality of 38 instead of 51. Gastro-enteritis registers by far the highest excess—a London rate of 9·4 against 1·7 for New York.

This unnecessarily high toll of deaths from gastro-enteritis is associated to some extent with war. The rate in London has risen steadily from 6·1 in 1940, and the rate for the whole of the country is also increasing. In Scotland, a rate that had been moving upwards during 1926–38 has lately registered a sharp increase. War conditions of life provide a partial explanation; bottle-feeding is commoner, and because of the call for woman-power more children are in institutions. Overcrowding in maternity homes and hospitals, and a deterioration in the quality of nursing staffs, may also be implicated. The most important factor, however, if we may judge from Scottish experience, is the housing situation: less houseroom means less hygiene. A study of infant mortality in Cincinnati[2] showed a positive correlation between the incidence of diarrhœal diseases and the percentage of private indoor toilets.

EXUDATIVE TONSILLITIS

SORE throat is in season again and practitioners may be puzzled about how best to deal with those troublesome cases with exudate on the throat. To many doctors confluent exudate on the tonsils or pharynx suggests diphtheria, while follicular exudate is usually regarded as streptococcal. In actual fact extensive exudate is a frequent accompaniment of streptococcal infection; and faucial diphtheria, particularly in the adult or immunised child, often appears as a follicular tonsillitis or pharyngitis. When in doubt give antitoxin, is the only safe advice. That the bacterial ætiology of exudative sore throat is difficult to determine on clinical grounds alone is obvious from Cruickshank's[3] analysis of 342 cases admitted to an isolation hospital during 1942 with a notification of diphtheria. Only 36·5% of these were confirmed on bacteriological evidence as diphtheritic infections; the final diagnoses of the remainder were tonsillitis or pharyngitis in 40·9%, hæmolytic streptococci being recovered from two-fifths of these; Vincent's angina in 5·8%; and glandular fever in 1·1%. Cases of glandular fever are often notified as diphtheria because of the throat exudate and the associated adenitis. But the absence of severe toxæmia in a patient, often a young adult, whose throat symptoms have been present for some days, should raise doubts in the doctor's mind and suggest the examination of a blood-film. A stained smear from the throat of such a patient may show numerous fusiform bacilli and spirilla, and mislead the inexperienced clinician, who relies too much on the laboratory, into a diagnosis of Vincent's angina.

The complexity of the problem of exudative sore throat is brought out by a detailed clinical and bacteriological study[4] of 116 cases among 900 American Servicemen admitted to hospital with respiratory infection. The criteria for inclusion in the group were a temperature over 100° F. and exudate on the throat at the time of examination. Three throat swabs were daily taken from each patient and examined for hæmolytic streptococci. Samples of the patient's serum, taken at onset and after 4 weeks, were examined for antistreptolysin, and a significant rise in titre was regarded as evidence of streptococcal infection. Hæmolytic streptococci

1. Stocks, P. *Brit. med. J.* 1941, ii, 96.
2. The National Health Survey, 1935–36. Preliminary Reports: Bulletin no. 5. National Institute of Health, US Public Health Service.
3. Cruickshank, R. *Publ. Hlth*, 1943, **57**, 17.
4. Respiratory Diseases Commission, *J. Amer. med. Ass.* 1944, **125**, 1163.

were isolated from rather less than half the total, and a significant increase of antistreptolysin occurred in half of these positive cases. In other words, less than a quarter of the total cases gave unequivocal evidence of infection with the hæmolytic streptococcus. However, many of the patients with streptococci in the throat and an insignificant rise of antibody were probably also suffering from streptococcal infection of milder degree. Clinically, this latter group resembled the larger series from whose throats hæmolytic streptococci could not be recovered; in these two groups the onset was less acute and local signs and symptoms less severe, while cough and hoarseness were more frequent complaints. Leucocyte-counts in the group with streptococci and antibodies averaged 16,000 per c.mm. on the first or second day: in the other two groups the average initial count was 9000. Extensive or confluent exudate was usually associated with hæmolytic streptococci in large or predominant numbers, but streptococci and antibodies were found as often in patients without tonsillar tissue as in those with tonsils or tonsillar tags. Clinical diagnosis of "streptococcal sore throat" or not, without previous knowledge of laboratory results, was correct in five-sixths of the non-streptococcal cases and in two-thirds of the unequivocal streptococcal infections, but only 15% of the patients with streptococci in the throat without significant rise in antibody were regarded as streptococcal.

The large proportion of patients with follicular tonsillitis and no evidence of specific bacterial infection will not surprise the experienced physician, but calls for more investigation into ætiology. In this series hyperplastic lymph-follicles on the pharynx were more commonly seen in the non-streptococcal cases, and the same observation has been made in other undifferentiated respiratory infections and in atypical pneumonia. A virus ætiology therefore seems possible. On the other hand, failure to isolate hæmolytic streptococci from infected tonsils is not conclusive evidence of a non-streptococcal infection. The organisms may be present only in the tonsillar crypts—a much higher proportion of clinically infected tonsils yield hæmolytic streptococci on dissection after removal than on swabbing[5]—or the streptococcus may be missed because it does not produce hæmolysis on the blood-agar plate, or it may grow primarily only anaerobically or in an atmosphere with 5–10% CO_2. These causes combined probably explain the failures, reported in our correspondence columns,[6] to isolate hæmolytic streptococci in every case of scarlet fever, although other organisms—for example, *Staph. aureus*—sometimes produce the scarlatinal syndrome.[7]

TRAINING IN INDUSTRIAL MEDICINE

INDUSTRIAL health is a composite subject dealing with the health, safety and welfare of people in their working environment, and the services of various experts such as doctors, engineers, chemists and physicists are needed to elucidate many of the problems which arise. In the introduction to his chapter in the annual report of the Chief Inspector of Factories,[8] reviewed on another page, Dr. E. R. A. Merewether draws attention to the scarcity of people qualified to deal with industrial health and welfare. In Britain, as in America, the demand for such people has outstripped the supply—a state of affairs which might lead to the discredit and regression of an essential service. He therefore pleads for extended facilities for academic instruction and practical training of acceptable standards. He suggests[9] that such instruction should be given both to undergraduates and postgraduates. Apart from refresher courses for postgraduates he thinks there should be an extended course leading to a registrable diploma in industrial health. The course should not be stereotyped and might be devised by the various universities to emphasise the health risks in the main local industries, such as agriculture, potteries, steel, metallurgy, mining, wool and cotton. In this way each course, while providing instruction over the whole field, would acquire distinctive value by emphasising the health risks of one important industry.

Last year the Medical Research Council set up a department for research in industrial medicine at the London Hospital under the direction of Dr. Donald Hunter. This is staffed by one medical assistant, three chemists, a physicist and a lady almoner, as well as clerical staff and technicians, and costs about £7000 a year to run. It is at present carrying out two large-scale investigations, one in collaboration with Dr. A. I. G. McLaughlin, HM Medical Inspector of Factories, into pneumoconiosis in iron and steel foundries, and one with Dr. William Evans into the life and livelihood of the cardiac worker. It has also investigated several short-term problems, such as the effect of aluminium and alumina on the lungs of duralumin aeroplane propeller grinders,[10] toxic polyneuritis resulting from the manufacture of tricresyl phosphate,[11] and the toxic manifestations of benzene in workers with aeroplane dope and rubber solvents.[12] The similar departments to be inaugurated in Manchester, Durham and Glasgow by the Nuffield Trust will find no lack of subjects for investigation. The department at Manchester is likely to develop into an excellent sister to the one at the London Hospital. But the grant of £4000 a year to the other two universities will hardly pay for a department which must employ experts in so many branches of science, and carry out mass investigations. In Glasgow the department is to be a subdepartment of social medicine. Industrial medicine however is concerned with a much wider field than the sociological aspects of industry.

THE TIMES

ON Jan. 1, 1785, appeared the first copy of the *Daily Universal Register*, known from three years later as the *Times*. Last Saturday saw the 50,000th issue produced (like the 1st and all the others) from Printing House Square, London, EC. There have been periods when the *Times* was hot for reform, and others when it coolly reflected the opinion of the ruling classes. But however its political record is assessed, it has played a large part in forming the highest standards of journalism, and today it lives up to those standards. Those who understand the difficulties of newspaper production recognise the *Times* as one of the finest products of English life—indeed of Western civilisation. For our part we are particularly happy at the evidence that this influential journal is nowadays well informed on the achievements of medicine and is intent that everyone should have the benefit of these achievements.

On Nov. 22, Dr. HENRY BRIGGS, emeritus professor of midwifery and gynæcology at the University of Liverpool, died at his home at Hoylake, Cheshire. He was 88 years of age.

IN Russia newly qualified doctors at the front are to be given the opportunity for further study. Postgraduate courses in radiology and neuropathology have already been given on the First Ukrainian Front. The former lasts two months and the latter six weeks, with eight hours' study daily. Officers attending the courses are attached to two or three large military hospitals, and often visit civilian hospitals as well.

5. Rantz, L. A., Jacobs, A. H., Kirby, W. M. M. *J. clin. Investig.* 1943, **22**, 419.
6. *Lancet*, Sept. 16, 1944, p. 390; Oct. 7, p. 486.
7. *Ibid*, 1942. ii, 732.
8. Cmd. 6563. HMSO. 1944. 1s.
9. *Med. Pr.* Oct. 11, 1944, p. 233.
10. *Brit. J. indust. Med.* 1944, **1**, 159.
11. *Ibid*, p. 227.
12. *Ibid*, p. 238.

Reconstruction

FULL EMPLOYMENT

SOME MEDICAL IMPLICATIONS

(FROM A CORRESPONDENT)

SIR WILLIAM BEVERIDGE has called his new report *Full Employment in a Free Society*.[1] In so doing, he has straightway placed his finger on a vital point. Neither Russia nor Germany have found it impossible to produce full employment, but the loss of personal individual freedom involved has been great—in one case so great that few can seriously think it worth while. Democracies in war-time have also achieved full employment. The price has been conscription and direction of labour, allocation of raw material and control of industry, rationing and price control, and an unbalanced internal budget. Here, too, the loss of individual freedom has been heavy, particularly in the matter of choice and location of occupation. Can we achieve full employment without resorting to all these devices, or to the extreme measure of socialisation? Sir William Beveridge's answer is that we can.

The essential liberties which he believes must be preserved at all costs are freedom of worship, speech, writing, and teaching; freedom of assembly and of association for political and other purposes, including change of Government by peaceful means; and freedom in the choice of occupation and in the management of personal income. He excludes from the essential freedoms the liberty of a private citizen to own the means of production and to employ other citizens to work them for a wage. This liberty must justify itself as a device; but only if it fails to produce full employment is the expedient of socialisation worth trying.

ENDS AND MEANS

The target figure set is a maximum of 3% unemployed (about 500,000), with a greater number of jobs than workers as a continuous condition. The 3% would in fact be people out of work mainly when in process of changing a job, or as a result of industrial friction or seasonal fluctuations. To achieve this situation, the first need is psychological: a common aim generally agreed, and finance subordinated to that aim. The aim proposed is the deliberate abolition of want, ignorance, squalor, ugliness, and disease. The economic measures necessary are more complicated.

The first and by far the most important is that the total amount of money spent in the country should be enough to keep everyone busy. The determining factor in expenditure should no longer be the amount of money nominally available but the number of pairs of hands waiting to work. This proposal reflects the important discovery, put to practical test during the war, that national finance should not be treated as if it were an individual or business budget. National finance is not simply a matter of paying for government expenditure by taxation and borrowing; it is also a machine for injecting additional money into circulation to cover increases in national wealth. If the injection is made too fast, there is more money than goods available to be bought and the result is inflation; if too slow, the goods fail to sell, and the result is unemployment. Sir William Beveridge has aimed at devising machinery for making the speed of injection just right. He proposes a new type of national budget to lay down the total national spending for the year, this to be dealt with under five headings:—

(1) *Communal spending* on essential services which for social reasons should not be sold: Defence, order, free education, the National Health Service, roads, drains, and public works. This money to be spent by Government authorities, both national and local.

(2) *Public business spending*, on industries under Government control, or to be brought under Government control. This should include transport and all complete monopolies.

(3) *Private business investment*, which should be brought under government control, both to steady fluctuation and to promote socially desirable investing. The state agency would be a National Investment Board.

(4) *Spending by private people* on their personal needs—by far the biggest item. The Government can increase or steady this in two main ways: (*a*) through the social security scheme, by increasing benefits and decreasing contributions, or vice versa; or (*b*) through progressive taxation, which serves to redistribute personal wealth and to inculcate personal responsibility for governmentally supplied services.
Taxation is thus looked on more as a social surgical instrument than as a financial necessity.

(5) *State spending* on the necessities of life (food, fuel and so on) for selling back later to the public, at a price based not on their cost but on what people can afford. This "joint consumption outlay" is Sir William Beveridge's method of maintaining price control and subsidy of essential goods. It is an ingenious way of influencing private spending, while still leaving free choice to the public.

The basis of the new budget will be an estimate of the amount of money which needs to be spent so as to provide work for everyone. Its basis, then, will be available man-power and not yield of taxation. The estimated spending under the five headings given above will be worked out. If it falls short of the spending needed to produce full employment, it must be increased on a basis of social priorities. The extra spending may need to be very large, particularly at times when private spending and investment show signs of declining—that is, when there is a tendency towards a slump. The old idea of the state economising when times are bad is now recognised by all economists as the surest way to make things worse. It is during a depression that the state must spend most to keep up employment.

The part of the national budget spent by the state will be met by taxation and borrowing. There is no inherent harm in a permanently unbalanced budget; but taxation is preferable to borrowing, since borrowing increases the number of people to whom the state must pay interest for doing nothing. It must be part of the state's policy continually to lower interest rates until, as Keynes says, the rentier dies of inanition. But fear of borrowing, and borrowing heavily, must never be allowed to stop the spending necessary to give full employment.

The National Investment Board is to have three jobs. First, it must have the power to get full information about proposed new investments. Secondly, by giving a state guarantee, it must help socially desirable projects to borrow money from the banks. Thirdly, it must be able to stop socially undesirable projects from borrowing.

There are two other measures, besides keeping up total national spending, which are necessary for full employment. They are social and not economic. First, people must be prepared to change their work if necessary. Secondly, work must be brought to the people, and not people to the work; that is, the location of industry must be controlled. As Sir William Beveridge points out, difficulties arise not so much over change of job as over change of location of job. People are far more ready to alter their occupation than to move their homes.

International trade must take second place in a discussion on full employment. There can be work and money for all in the absence of any overseas trade. But there certainly cannot be even the necessities of life, on which to spend the money earned, without overseas trade. We must have imports to provide our food and to maintain our standards of living, without which full employment cannot yield its dividend of health and happiness. To maintain our imports, Sir William Beveridge says, we must balance our accounts with the

1. Geo. Allen and Unwin. 12*s*. 6*d*.

rest of the world, and keep our foreign economic policy reasonably stable, so that other countries know what we want from them and what they can expect in return. We must try to get as many multilateral trade agreements as possible; this means that if we supply country A with exports, A in return does not necessarily have to supply us, but can supply country B, which in turn gives us the imports we want. If we cannot have world-wide agreements, then we must fall back on regional agreements or even agreements between ourselves and individual foreign countries.

RESULTS OF FULL EMPLOYMENT

Apart from the obvious benefits in mental and physical health which full employment will bring, the situation of more jobs than workers will have important results on industrial relations. Workers in war-time no longer fear dismissal in the same way that they did before the war. There will be, then, a tendency to absenteeism and bad time-keeping. This is a problem for the industrial psychologist. If workers can be educated to realise the social value of the work they do, all but the psychopathic should treat their jobs seriously. But it will be hard for employers to keep their workers if their product has no obvious social value, or is socially undesirable. Furthermore, the bargaining strength of labour will be greatly increased by full employment. And if one section of workers secure an increase in wages, the result will be that the price of their product will be raised for everybody. The answer is that the Trade Union Congress must have a unified wage policy; and there should certainly be an increase in arbitration for settling wage disputes.

COMPARISON WITH THE WHITE-PAPER

Though Sir William Beveridge worked perforce independently from the Government experts, the conclusions of the Government white-paper on full employment[2] do not differ greatly from his, save in vigour. The white-paper is ready to unbalance the budget, but—presumably in deference to those who still think the state's accounts are in essence the same as personal banking accounts—it says there must be a long-term balance. Sir William aims at preventing slumps; the white-paper only tries to iron them out. Finally, the white-paper concentrates rather more on the immediate future, while Sir William suggests a recurring series of 20 year expenditure plans, each based on social priorities. The official and unofficial remedies are not then so greatly different. It is now up to the patient to decide which is finally chosen.

IMPLICATIONS FOR MEDICAL PLANNING

This new presentation of national economics must react on services planned or run by the state. If it is a good rather than a bad thing for the state to spend liberally on salaries and buildings—if the reason for doing things is to be social desirability rather than money to be made—there is no reason why the state should not be a fair and generous employer. The criterion must no longer be economy but efficiency. This should mean that the multitude of checks—for example on the issue of stores and apparatus—beloved of bureaucracy, can be swept away. It should also mean that, in discussions on rates of pay, the profession should exercise reasonable restraint in putting a fair price on the value of its services. If the state has no need to cheese-pare, we have no right to grasp. The nation wants a first-rate health service as a right; it can afford to have it; and the doctors want to provide it. The equation should not prove insoluble.

The other major implication of Sir William Beveridge's proposals, though not of the white-paper, is one for which doctors may well have to fight. His criteria of a free society certainly do not apply to the majority of doctors in state employ. They have neither the right to publish nor to associate freely for political ends. Safeguarding these rights will be comparatively easy for the clinicians. It will be more difficult, yet even more important, for the administrators to be able to speak their minds publicly, if stultifying bureaucracy is to be avoided.

2. Employment Policy. Cmd 6527. HMSO. 6d.

Special Articles

NATIONAL HEALTH SERVICES IN NEW ZEALAND

PAYMENT OF PRACTITIONERS

IN November, 1935, the Labour Party came to power for the first time in New Zealand. It commanded a large parliamentary majority, and one of its election promises had been the establishment of a national medical service.

In 1936 the government, with the declared purpose of introducing a system of health insurance, set up an investigation committee. This consisted wholly of MP's of the government party, and though it took evidence from interested bodies, including the British Medical Association, there is reason to doubt whether such evidence made much impression on its preconceived ideas. The only medical member of the committee was a junior practitioner who had just been elected to parliament.

The government wanted a free medical service for the whole population, including general-practitioner service, hospitals, laboratory work and specialists. The BMA wanted a free service for the indigent, and a contributory system of insurance for the less affluent, but wished to leave unchanged the existing system by which those who could afford to pay the general practitioner or the specialist did so, either privately or through friendly societies. Protracted discussions took place. In 1937 Sir Henry Brackenbury visited New Zealand and his advice was made available to the government as well as to the BMA. No satisfactory solution was found, and in 1938 the discussions ended in deadlock. In September of that year the government introduced its Social Security Act which shortly became law. This raised money by a tax of 1*s.* in the £ on all incomes, from which it proposed to finance a generous pensions scheme, and a comprehensive series of medical, hospital and related benefits. This Act was a major issue in the election of November, 1938, in which the Labour government was again returned to power.

The benefits under the Act were intended to begin in April, 1939, and negotiations were reopened to arrange for their implementation. It was not, however, found possible to reach agreement on the immediate provision of all services, and the history of the progress of the new service since then has been the piecemeal provision of one benefit after another to build up a service which still remains far from comprehensive. In 1939 treatment in all mental hospitals (which are government institutions) was made free, and a maternity benefit scheme was introduced, which after modification was accepted by the profession. Under this scheme the general practitioner reports to the local MOH the fact that he has attended a confinement or a miscarriage, and he receives a payment from the Social Security Fund. The fee for attending a miscarriage is £3, for a confinement £5 5*s.* This includes the usual antenatal attendances, but certain extra payments are allowed in respect of complications and of mileage. The doctor may not charge the patient any fee. A recognised obstetric specialist, if called in, may charge the patient what fee he likes. In this same year the government introduced a payment of 6*s.* (since increased to 9*s.*) per day per occupied bed to all hospitals, both public and private. This was accepted by the public hospitals as the sole contribution expected from the patient, any expenses in excess of this being made up from the local rates. In the private hospitals, the payment counts as a grant-in-aid towards the normal charges of the hospital or nursing home. Where the staffs of the public hospitals had previously been honorary, they now began to receive part-time salaries ranging from £250 to £600 per annum.

The form of the general-practitioner service had not been decided when war broke out. A considerable

number of medical men joined the Forces and went overseas. It was the expectation of the medical profession that the establishment of any further public services would await their return. But in 1941 the government decided to establish a general-practitioner service. It was to be a capitation system, available to all, remuneration to the doctor to be at the rate of 15*s.* per annum for every man, woman and child on his list, with extras for mileage. The members of the public were invited to enrol on the lists of doctors of their choice. The public made little effort to avail itself of this invitation, and fewer than 50 doctors coöperated out of a possible 700 or 800 in the country. The scheme failed. In November, 1941, the government introduced a new system of payment for general-practitioner services, based on the principle of payment per item of service. A fee of 7*s.* 6*d.* was allowed as the basic fee for seeing a patient in the doctor's consulting-room or the patient's home. This was increased to 12*s.* 6*d.* for attention provided between the hours of 9 PM and 7 AM or at any time on Sundays. The doctor could claim this fee from the government on presenting the patient's signature to a statement that he had been seen and treated; or alternatively he could charge the patient 7*s.* 6*d.* or any higher fee and empower the patient to recover from the post-office a rebate of 7*s.* 6*d.* on every fee paid. Under the latter alternative, however, the doctor could not sue an unwilling patient for more than 7*s.* 6*d.* per service. Both these methods of payment have proved popular and continue today. They are used with approximately equal frequency. They are not, however, the only methods of payment. In fact there are in coexistence five methods by which the government pays for general-practitioner services.

The following are comments just received from our New Zealand correspondent on these different methods and on the general-practitioner service as a whole.

FIVE WAYS OF PAYING THE DOCTOR

1. *Salaried appointments.*—Payment by salary is limited to a few remote and scattered rural areas and ones with a large proportion of natives. On the whole the salaries and conditions are satisfactory to good, and the step represents an advance, because previously most of these areas had no medical service at all, or only a very indifferent service.

2. *Capitation fees.*—Payment by capitation fees has never developed beyond the relatively small number of doctors who undertook it in the first place. Most of these men lived in one- and two-men country districts, a few in towns. When the fee-per-service schemes became universal, these men mostly wanted to remain in capitation, and did so. The other methods became applicable, of course, to persons who had not enrolled, or to newcomers to the district. How serious the confusion and overlapping between the two may be is hard to say—probably it is not serious at all. It may result in some loss of money to the government, but that would not be much. Those doctors using capitation like it for its simplicity and its removal of all financial aspects from their relations to patients.

3. *The fee for service.*—Under this system the practitioner receives 7*s.* 6*d.* for each item of service rendered, with extras for night attendance and the like. The patient certifies on a form that the service was given, and on another part of the form the doctor claims the money from the health department. He sends in his heap of forms every month and receives a cheque in payment.

This system was intended by the government to be the standard method, the difference between 7*s.* 6*d.* and the usual fee of 10*s.* 6*d.* being reckoned to be more than made up by absence of bad debts, and unwillingness to charge for subsequent perhaps brief attendances. The British Medical Association here officially opposed it, and called on its members not to adopt it. Despite this it has gradually gained common acceptance, even high BMA officials openly admitting that more than half—perhaps much more—of their members have come to use it.

The advantage of this system is that it is the simplest of all—except perhaps capitation—for both patient and doctor; it eliminates accounts, bad debts, and standing in queues at post-offices to obtain refunds. To the doctor the fee is more than satisfactory, for there are no bad debts. To the patient there is no financial barrier.

The disadvantage is that the system may be abused; abuse by the doctor involves over-attendance—e.g., putting a poor patient into a private hospital and over-visiting in order to work up a sizeable fee, say for an appendix operation; and counting all trivial follow-up attendances as valid for the fee. Abuse by the patient includes frivolous calls and attendances, and demand for unnecessary medicines. As it must meet an unknown number of calls, the Social Security Fund has to be literally "bottomless." Some obvious abuses can be detected and stopped by the local officers of the health department, but many must get by. No worth-while details of the costs are made public by the government; but it is known that it is comparatively easy for a young doctor, or a moderately competent doctor, to earn £3000–£4000 a year, while the more efficient, by dint of organisation, are alleged to reach £10,000.

4. *The refund system: use of token fee.*—On this plan the doctor collects a token fee in cash—usually 5*s.*—and asks the patient to fill up the form (as in 3) as well, with which the doctor claims direct for 7*s.* 6*d.* This system is allowed by the government but disapproved by the BMA. It lends itself to concealment of income, and the patient is inclined to resent being asked for the 5*s.* On the other hand it is held by some to be a barrier to frivolous calls.

5. *The refund system proper.*—Here the patient receives an account as formerly—usual fees are at the rate of 10*s.* 6*d.* per attendance—and on payment is given a detailed statement as to dates and number of services rendered. Each of these constitutes a claim for 7*s.* 6*d.* for which he goes to the post-office.

The BMA favours this scheme, as perpetuating former relations with patients and making it hard to conceal income. For the doctor, however, it means all the old business of keeping accounts, sending them out repeatedly, and bad debts. Increasingly the patients become disinclined to play the game; they feel that Social Security should pay their doctor's bills, they resent being asked for a "surcharge," and they object to have to go to the post-office to collect their dues. Actually in practice this scheme is rapidly disappearing under its own inconvenience, in spite of BMA support.

THE GP SERVICE UNDER SOCIAL SECURITY

It is remarkable how readily the people and the doctors have come to accept these schemes. They represent of course nothing new in medical practice, but only altered modes of payment. Indeed the complacency of all concerned—people, doctors, government—towards past modes of practice is disturbing. If even a small proportion of the huge sums now reaching practitioners had been set aside in favour of research, a postgraduate teaching school, and the provision of refresher courses, they would have been far more productive.

No attempt has been made, or even suggested, to coördinate the work of general practitioner and hospitals. Money is poured out on the completely unorganised individual GP service. The work—as tended to happen under the British National Health Insurance scheme—is partly pushed on to the hospitals, which have neither money, staff, nor room for it. The people get poor value for the money paid to the GP.

It is hard to be certain of the effect of Social Security on general practice, because in war-time decreased personnel and increased demands have masked it. My impression is that standards have fallen, and that the economic motive in general practice has become even more predominant than before. The younger men and women are tempted into general practice by the high and easy rewards. As the effect of high taxation begins to be felt they tend to go easy or to give up general practice altogether. The younger men just qualifying are confused and sceptical about the whole position. It is certain that neither preventive medicine nor education for health has received any real impetus from Social Security legislation. Strangely also it has not facilitated that spontaneous grouping of medical men into coöperative teams which was the hope of a government spokesmen. The profession—while with some justification boasting victory over the government—is uneasy in spite of its undreamt-of rewards.

(*To be concluded*)

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

THE 162nd session opened last Tuesday with an address from the President, Sir HERBERT EASON. He began with a tribute to three former members of the Council who had died since the last meeting, Sir Humphry Rolleston, Mr. Hey Groves and Sir Robert Kelly. He recorded with regret the retirement from the Council of Sir Henry Tidy, whose modesty and integrity made him one of its most influential members; of Mr. E. L. Sheridan, chairman of the Dental Board, "a most charming colleague and one who represented the highest traditions of the dental profession," and of Prof. J. H. Burn, whose profound knowledge of pharmacology was of value to the pharmacopœia committee. He welcomed Lord Moran as representative of the Royal College of Physicians of London, Prof. W. J. Dilling as representative of the University of Liverpool, and Mr. James Lyons as an additional member under the Dentists Act, and he congratulated Dr. E. W. Fish on his appointment by the Privy Council as the new chairman of the Dental Board.

REVISION OF THE CURRICULUM

On Sept. 18, the President said, a letter was received from the Minister of Health referring to the report of the Interdepartmental Committee on Medical Schools (the Goodenough Committee) and saying that it would greatly assist him to know whether early action would be taken by the Council with regard to the revision of the medical curriculum, and if so what was likely to be the general nature of such action. "In view of this communication from the Minister I called a joint meeting of the education and examination committees on Oct. 4, and the Council have resolved that in view of the report of the Interdepartmental Committee, the Council are prepared to take the initiative forthwith in the matter of the revision of the medical curriculum. In order to give effect to this resolution a revision will be undertaken forthwith of

(1) The recommendations in regard to the registration of medical students, incorporating resolutions in regard to general education and preliminary scientific subjects, adopted by the Council on May 28, 1937.
(2) The resolutions in regard to professional education adopted by the Council on May 29, 1936.
(3) The recommendations in regard to professional examinations adopted by the Council on May 25, 1933.

Four committees have been appointed to consider and report jointly to the education and examination committees on the various stages of the curriculum."

EDUCATION IN THE COLONIES

Since Sir Richard Needham's visit to the schools of medicine in Uganda and Nigeria made in 1939–40, the Secretary of State for the Colonies has appointed a commission under the chairmanship of Sir Cyril Asquith to consider the principles which should guide the promotion of higher education, learning, and research and the development of universities in the Colonies; and to explore means whereby universities and other appropriate bodies in the United Kingdom may be able to coöperate with institutions of higher education in the Colonies. The President reported that on July 27 he gave evidence before the commission.

THE FACTORY DEPARTMENT IN 1943

THE annual report of the Chief Inspector of Factories for 1943 [1] reflects the quickening of interest in the health, safety and welfare of factory workers. The story of the year's work is one of achievement carried out in a breathless tempo with a depleted staff. For the first time since 1938 there have been fewer accidents, and the reduction in fatalities noted in 1942 has been maintained. The number of accidents to women has risen, but more women were working in factories, and the accident-rate to women in the munition industries—the main source of such accidents—has fallen by about 3 per 1000 Nevertheless the total of 309,924 non-fatal and 1220 fatal accidents shows that there is still need for improved methods of accident prevention.

1. Cmd. 6563. HMSO. 1944. 1s.

The reduction in accidents took place during the later months of the year and coincided with a widespread shortening of working hours. Sir Wilfrid Garrett quotes the experience of a large factory where three-quarters of the accidents happened between 4.30 PM and 6.45 PM, a fact which reinforces the argument for a shorter working day. The general tendency is to reduce hours of employment, but long hours are still being worked in some factories vital to the war. Experience in 1943 has again shown that production is not in direct ratio to the hours worked. A recent report by the Industrial Health Research Board stresses the difficulty of isolating reduction of hours from other factors affecting output, but Sir Wilfrid says that inspectors all agree, and many in management concur, that reasonable hours have a great effect on the well-being and efficiency of all concerned. As regards accident prevention, Sir Wilfrid Garrett thinks it a misdirection of energy for safety organisations to try to make the worker accident-conscious by methods akin to high-pressure salesmanship. "Education in method has its place but general exhortations to workers to be careful are of little value unless it is abundantly clear that the management has done everything possible from its end."

The special investigations carried out by the department include the effects of radioactive substances and X rays; the danger of fire and explosion when grinding magnesium and aluminium, and of petrol fires in testing aircraft engines; the health risks inherent in handling leaded petrol, in patent fuel and flax factories, in steel founding, boiler-scaling and welding. The ventilation and conditions of work in electrical power stations and drop-forging establishments also received attention. An agreement on improved conditions in boiler-scaling and the cleaning of oil-fuel tanks and bilges on board ship was made during 1943 with representatives of employers' and workers' organisations. The report discusses the difficulty of harmonising the demands of the fuel economy campaign with adequate heating. Ventilating engineers and others too often regard general ventilation by fans as an acceptable method for removing dust or fumes. The department makes a clear distinction between general ventilation and local exhaust ventilation, the latter being required by law to take dust and fumes away from the workrooms. Great improvements in factory lighting were made during the year.

DISEASES OF INDUSTRY

Dr. E. R. A. Merewether, in his chapter on industrial health, discusses the effect of war-time processes on the incidence of notifiable industrial diseases. The number of cases of lead poisoning notified during the year (46 with 5 deaths) is the lowest ever recorded. No cases occurred in people engaged in shipbreaking and vitreous enamelling, and only 2 were found in potteries and 4 in the painting of buildings. All these processes have been restricted during war-time. On the other hand there have been more cases of poisoning concurrent with greater activity in the smelting of metals and the manufacture of paints and colours. Two cases of phosphorus necrosis of the jaw were observed in men working at a phosphorus filling factory. Poisoning by phosphorus is now never seen in peace-time. Cases of chrome ulceration rose from 89 in 1942 to 226 in 1943, largely because 131 people were affected in a new process of handling sodium chromate; the nasal septum was the site of the lesion in all except 2 of these cases. There were 16 cases, with 4 deaths, of toxic jaundice; 14 of these (3 fatal) were caused by TNT and the other 2 by dinitrotoluene and chlornaphthalene. Of 19 cases notified as toxic anæmia, 7 had an occupational cause; 6 were due to TNT and 4 of these were fatal. Only 79 cases were notified as aniline poisoning, compared with 204 in 1942; TNT was responsible for 62 of them. Poisoning by TNT can thus be notified as toxic jaundice, toxic anæmia or aniline poisoning (cyanosis) according to the predominant signs and symptoms. The single case of chronic benzene poisoning notified was in a man of 40 who had been employed for about 19 years on spreading cloth with a celluloid rubber solution containing benzene; he died from aplastic anæmia ending in acute leukæmia.

Only 2 cases of arsenical poisoning were notified, but one of these, a maker of sheep-dip containing sodium

arsenite, had carcinoma of the lung. Three similar cases in sheep-dip workers have been notified since 1939. A connexion between arsenic dust and malignant disease of the lungs has been suspected for many years and the problem is now being examined by a committee under the chairmanship of Prof. M. J. Stewart. There were 4 fatal cases of anthrax and 1 non-fatal case of mercurial poisoning. Of the 160 cases (15 fatal) of epitheliomatous ulceration recorded, 111 were due to pitch or tar, 48 to mineral oil and 1 to shale oil. A substantial number of the cases, especially those due to pitch or tar, were notified in an early stage and the warts or keratotic new growths were treated with radium. In many such cases no pathological examination is made and no doubt some of them were in the pre-malignant stage. The case of manganese poisoning notified was only the second since the condition was made notifiable in 1936. A man of 49 who had been crushing ferro-manganese for 2 years developed the typical mask-like expression, monotonous voice, slow articulation and hesitant gait. A fatal case of manganese poisoning, not reportable under the Factories Act, occurred in a man who had been engaged in welding tram-lines, using an electrode containing 14% manganese under poor conditions of ventilation. One case of compressed-air illness was notified, making 16 cases in the 4 years since notification became compulsory.

All workers engaged in handling radioactive luminous paints had blood-examinations and were closely observed. No severe disturbances of the blood-picture were observed; leucopenia was present in 5% of the cases, but nearly 40% showed a relative lymphocytosis. Some of the workers had slight chronic dermatitis of the fingers and one had an acute radium burn apparently due to direct contact with the luminous paint. Estimations of the radon content of the exhaled air after removal from exposure for 48 hours were carried out by Professor Russ in about 100 luminisers; 9 gave positive results, but in 7 of these Dr. E. C. Gray found no permanent retention of radioactive material in the body.

Analysis of the 695 gassing accidents, with 27 deaths, shows the effect of war-time conditions, the main gases responsible being carbon monoxide, chlorine, nitrous fumes, trichlorethylene, sulphur dioxide and carbon tetrachloride; 9 cases of gassing by phosgene were also reported. In the section on the health hazards of handling leaded petrol it is pointed out that tetraethyl lead mainly affects the nervous system, in sharp contrast with poisoning by inorganic lead compounds.

MEDICINE AND THE LAW

Borrowed Qualifications

FREQUENTERS of our criminal courts will have noticed how very different are the pictures of the same man painted by the prosecution and by the defence. Not long ago, for instance, before the magistrates at Burnham (Somerset), William Hugh Rankin, aged 55, of 72, Lavernock Road, Bexley Heath, pleaded guilty to charges of having falsely taken the title of bachelor of medicine and bachelor of surgery. He had prescribed sleeping tablets containing drugs on the Poisons List, adding after his signature the letters "MB, ChB" and the address "8, Harley Street." There was evidence that he had told people that he was practising as a surgeon in London and that his visit to the West Country was his first holiday after an uncomfortable time in the blitz. He had claimed acquaintance with a practitioner in the district ("do you remember me? We were at St. Thomas's Hospital together,"—or words to that effect). Not recognising him as a contemporary, the doctor consulted the hospital list and subsequently took the Medical Register to the hotel where Rankin was staying, in order to compare its entries with the signature in the hotel books. His suspicions being aroused, the doctor then informed the police, identifying Rankin's face from records which an inspector brought him for the purpose. Proceedings were then taken by the Medical Defence Union.

The advocate for the accused, who spoke of him as Dr. Rankin, said his client was a doctor of medicine at Columbia University in California who had devoted most of his life to medical research; he came to this country in the last war and served as a ship's doctor in the Merchant Navy. Dr. Rankin, he explained, could not be present in court because he was taking a medical course at the Bristol postgraduate medical school and was studying for an examination to be held in January. On the other hand the advocate for the prosecution stated that the accused had not put his name down for the examination, and the course of study he was taking was not the slightest use for the examination for which he was proposing to sit; "I don't know how it comes about that he was admitted to this course." The defendant's advocate conceded that his client had been a very foolish man but contended that he had suffered for past delinquencies—a reference perhaps to those police records which, if the accused had not pleaded guilty, could not have been mentioned. The chairman of the bench put it a little higher than mere foolishness. "This man," he said, "is a dangerous individual possessed of amazing impudence and cool, calculating effrontery; it is vitally important that the public should be protected from charlatans." The punishment he proceeded to impose was a fine of £10 on each of two charges together with the payment of certain costs.

Alleged False Pretence by Unregistered Practitioner

In another recent case, at the Old Bailey, an unregistered practitioner was found not guilty on a charge of false pretences. She was Mrs. Astrid Hill; being fully qualified to practise in Norway, she obtained admission to the Medical Register with permission to practise here subject to conditions; her name was later taken off the Register. The principal witness for the prosecution was a Downham practitioner who said that Mrs. Hill applied to him for the post of locum tenens when he was about to take a holiday. She gave him to understand that her name was on the Register and she told him her Norwegian qualifications; she asked for an advance of £10, which he gave her. This payment was the subject of the indictment, the false pretence being her statement that her name was on the Register. Had he known that the statement was not true, he would, he said, never have given her any money at all. Mrs. Hill said she had practised in Oslo for 20 years without the slightest suggestion against her. She married an Englishman in 1935. Her name was placed on the Medical Register in 1942, but was erased later because letters sent by the medical authorities did not arrive and she therefore had no chance to reply to their questions. She had applied for reinstatement without success. She intended to apply again. It was because she thought her application would succeed that she offered herself for the post of locum tenens. She denied having said anything to lead the prosecutor to believe that she was on the Register. Mrs. Hill was found not guilty and was discharged.

PRINCESS TSAHAI MEMORIAL FUND

THE task of building a hospital in Addis Ababa, to the memory of the young Princess Tsahai, is going forward. Readers will remember [1] that this daughter of the Emperor Haile Selassie, who trained as a nurse in England during the Italian occupation of her country, was moved by a great wish to benefit the health of the Ethiopian people. Her death soon after her return home was a tragedy for her country as well as for her friends. Her father had created a trust fund for her amounting to £13,704 in British war loan, and this, in accordance with a wish expressed before her death, the Emperor has now placed at the disposal of the memorial council for the use of the hospital. A part of this sum has already been despatched to roof the hospital, but further funds are needed to equip and endow it. Three wards are to be named after British friends of Ethiopia: Major-General Orde Wingate, who led the Emperor's Army to victory in 1940; Dr. John Melly, who raised and led the British Ambulance Service in Ethiopia during the Italian invasion of 1935; and Lord Davies, the late chairman of the memorial council. Lord Horder, the present chairman, will be glad to acknowledge donations and annual subscriptions, which should be addressed to him c/o Messrs. H. Reynolds & Co., hon. chartered accountants, 1, Bloomsbury Square, High Holborn, WC1.

1. See *Lancet*, 1944, i, 795.

Major-General Sir ERNEST BRADFIELD has been granted the local rank of lieut.-general while holding his present appointment at the India Office.

In England Now

A Running Commentary by Peripatetic Correspondents

I AM horrified to see the suggestion, discussed in the Goodenough report, that the University of Oxford should in future have a small undergraduate medical school of carefully picked young Herrenvolk who are going "to become teachers, investigators and consultants rather than general practitioners." I hate to think that, whenever we get a first-class lad in our medical school at Mudport, Oxford may come along with (no doubt) a golden spoon, and leave us with the skim-milk. The Goodenough Committee nicely sets forth the pros and cons of this proposal, but does not comment on what is surely its most serious drawback—the effects upon the young heroes themselves. I can think of nothing more unkind, more misconceived, than to pick a boy out of the sane community of the average medical school, in order to train him for a messianic rôle in a Fuehrerschule. To rub shoulders, in the course of his work, with all sorts and conditions of men and fellow students is a cardinal part of his medical education; he needs this experience all the more if he has that in him which will make him "become a teacher, investigator or consultant."

* * *

The special smell of Stockholm this winter greets you even as you step out of the plane—fresh-cut wood and burning charcoal. With the stopping of coal shipments from Germany, enormous stocks of three-foot logs, mostly silver-birch and pine, have been piled everywhere. One result is that Stockholm, always clean and tidy, is now absolutely spotless with the absence of coal smoke. Imagine going about all day in London and finishing up with clean hands! The smell of burnt charcoal comes from the conversion of nearly all the cars to a most efficient system of wood-burning propulsion, the result of experiments by the Swedish Army before the war. Indeed the whole of Swedish life is conditioned by the plentifulness of wood and its products, such as paper: even the schnapps is made from wood.

Looking north over the water from the southern heights of Södermalm, on a sunny morning—the only sunny day in my three weeks' stay—Stockholm's colours are a warm beige, Venetian red, black and verdigris. The sparkling water is everywhere and the great mass of the King's Palace would be the predominant feature but for the red-brick, green and gold of the finest modern building in Europe—Österberg's not over-praised Town Hall. The girls are like the city, neat, clean and fresh, and at their best under twenty. For the older generation, who like 'em well-tubbed and without cosmetics, Sweden would be a paradise. The men, particularly the Army, showed, I thought, a tendency to pallor and spottiness. I had many arguments about this and came to the conclusion that it might be due to a combination of lack of fresh vegetables from the diet, lack of sleep—the Swedes never go to bed—and alcohol. Alcoholism is Sweden's no. 1 social and public health problem. It is said to have improved since the introduction of spirit rationing, but I saw more drunks in three weeks in neutral Sweden than in three years of Britain at war. At 4 o'clock in the afternoon I saw a young mechanic lurching down a main street, knocking down a woman and a row of bicycles and finally pitching on to the cobbles in the road on his head. Sailors drink the spirit out of the torpedo-tubes and some have gone blind, and soldiers ask you for your ration in the streets. The only advantage of schnapps which was put to me was that it ruined your stomach long before you could get DTs.

* *

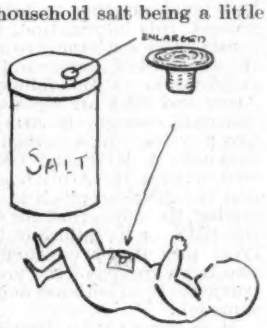
The thoughts of a Briton arriving in a neutral country naturally turn to food; and he is not disappointed in Sweden. Plentiful fish, particularly the delicious little Baltic herring in many forms, and smoked eel; reindeer and elk (the latter come into the suburbs of Stockholm and thousands are shot every year); capercailzie; roe deer and cranberry sauce; bilberries; sweet pickled cucumber. (Sorry, chaps!) Meat, bread and fats are rationed but on a generous scale. Of the drinks I chiefly remember mead drunk out of the ox-horn used by Gustavus Adolphus, at Uppsala; the sweet and insidious Swedish punch; and some 50-year-old whisky in Visby. Wines are reasonably plentiful but very dear. Indeed the prices for everything in Stockholm are somewhat above London ones, though of course quality is better and choice much more varied.

* *

Going to the cinema in Stockholm is a serious affair. Seats are numbered and reserved, and it is best to book in advance. Two performances nightly, at 7.15 and 9 PM, and you are lucky if you get anything more than the news with the big picture. Smoking is not allowed, and you must shuffle to your seat facing the other people in the row—to turn one's back is a social gaffe of the worst order. As for cuddling one's girl, the opera or church would be a more propitious atmosphere. Only one German film was showing when I was in Stockholm, as against large numbers of American, Swedish and British: indeed German influence was at a very low ebb and their propaganda jejune in the extreme. As for the doctors, while the older generation still looks almost exclusively to Germany, the younger ones have begun to read British and American medical literature in the last ten years, and the British Council has done much to keep up and increase their interest during the war years. Certainly the eagerness to hear about British medical and social developments, as well as the kindness and hospitality I received from everyone, shows the failure of the Germans to poison the minds of the Swedes against us.

* * *

If you do not mind your household salt being a little damp for three weeks, may I recommend the saline plug treatment of infantile umbilical hernia? I usually avoid prescribing patent remedies, but the small rubber bung (pat. 4390) provided by the manufacturers for keeping salt in, is just as effective for keeping a navel from popping out. Plug the opening with the hump, fixing the flat surface with sticking plaster. After three weeks clean it and replace it in the salt box; also clean the baby and replace it in its pram.



* * *

Time was—I say it in no boastful spirit but merely to record a relevant fact—when we had a housemaid. Rather a comely lass was Vera and left us only to better herself by marrying Albert, a handsome and entirely satisfactory young man now in the Army. Vera brought Albert to see us when he got his embarcation "leaf" and the conversation turned on how they proposed to spend those few delirious days. "We're going up to stop with Mum and Dad," said Albert, referring to his in-laws. "Dad and Albert gets on a treat," interjected Vera. "That's a fact we do," said Albert. "He's a proper chap is Dad." There was a pause while we all thought of Dad in warm terms. Albert broke the silence. "Last time I was on leaf," he went on, "him and me and a few others all goes into Braunton to have a few beers. I was all right all the time I was inside but when it come closing time the cold air struck me legs and I couldn't hardly stand up." "I know how it is," I murmured sympathetically. "It happened to me more than once in the last war—Funny stuff cold air." "You're tellin' me," said Albert. "Well, Dad, he takes me arm but 'tweren't a bit of use and I keeps falling down." "Too bad," I said. "Too right," said Albert, "but it didn't worry Dad." "All right, lad," he says, "let's get a hold of you." "Well, doctor, I weighs all of 160 pound but old Dad picks me up fireman fashion like I was a child and carries me 'ome a mile and a half." "And Dad's seventy, you know, doctor," added Vera proudly.

Letters to the Editor

CHRISTMAS

SIR,—A month ago you kindly published my appeal on behalf of the Christmas gifts fund of the Royal Medical Benevolent Fund. I am very grateful to those who have already forwarded their contributions, but may I ask those of your readers who are in sympathy with our work and who have not yet sent their donations to forward them as soon as possible to the hon. treasurer, RMBF, 1, Balliol House, Manor Fields, Putney, London, SW15, marked "Christmas gifts."

This appeal is urgent, for we have not yet received the sum required to meet the distribution of gifts.

THOS. BARLOW,
President, RMBF.

INTERCHANGE OF INFORMATION BETWEEN ARMY AND EMS

SIR,—The surgeons with the British Liberation Armies are bitterly disappointed that so few of the Follow-up Postcards (AF I 3216) which they have enclosed in the envelope containing the field documents of wounded men evacuated to the United Kingdom have so far been returned to them by EMS surgeons treating these patients subsequently. The consulting surgeon to this group (Brigadier A. E. Porritt) has written (October, 1944):

> "If only the EMS would realise how eagerly these cards are awaited over here, I am sure they would make a greater effort to return them. Not more than 1% have been returned since D-day."

Quite apart from the natural interest and eagerness of individual surgeons to hear how their cases have progressed, this information, together with comments and constructive criticism, are a valuable factor in improving the standard of surgery in the field. Instructions on the employment of the follow-up postcard issued by the Army and EMS are almost identical and quite explicit. Naturally enough, the Army surgeons cannot understand why a system which worked between the forward and base hospitals in MEF and CMF should not work equally well between the Army hospitals in France and Belgium and the EMS hospitals in the UK. It is scarcely surprising, therefore, that our surgeons are inclined to blame the EMS for its failure in this instance. It would be a great pity if this mutually beneficial liaison between two large groups of the profession cannot be improved, particularly as both are doing such splendid work on the same job.

It is not easy to discover why these cards are not returned. I suspect that the different systems of documentation are mainly responsible. I believe the plan tends to break down at the point where the essential clinical information which should be written off the field card is first transferred to the EMS case-sheet. The follow-up card is either missed or returned to the Army envelope to be dealt with later—and thereafter forgotten, because to the surgeon who has to plan the patient's treatment it is of little clinical importance.

Whatever the cause, I am quite sure that most EMS surgeons are unaware that there has ever been any complaint. I am equally convinced that as soon as their attention is directed to this a remedy will be found and this valuable system of interchange of information will work smoothly.

D. C. MONRO,
Major-General: Consulting Surgeon to the Army.

War Office, SW1.

DIRECT INTUBATION

SIR,—Major Freda Bannister and Mr. Macbeth lay down the principles of direct intubation clearly and convincingly (Nov. 18, p. 651). The truth of their contention can be readily demonstrated in practice by having the assistant move the neck from a position of extension to one of flexion while the laryngoscope is in position in the anæsthetised patient. A small point which I find useful in practice is to have the ward pillow or pillows replaced by a pillow of double thickness and firmer consistency when the patient is brought to the anæsthetic room. This simplifies procedure when the time comes to introduce the laryngoscope.

While I have not had an opportunity of using the laryngoscope designed by Major Bannister and Mr. Macbeth, I should have thought that the angle and deviation of the handle make it less efficient mechanically than one in which the handle is at right-angles to the blade. Macintosh's laryngoscope seems to me to have two great advantages not possessed by others: the ease with which the tongue is moved and kept out of the way; and the automatic tilting of the epiglottis. This instrument, used with the head and neck in correct position, has made direct intubation a simple and atraumatic procedure, even for those who, like myself, belong to that much maligned but singularly passive body, the occasional anæsthetists.

Rush Green Emergency Hospital, Romford. E. JAMES.

COMMISSIONERS IN CHILD WELFARE

SIR,—Recent correspondence in the *Times*, initiated by Lady Allen of Hurtwood and summarised in your issue of Sept. 23, has shown that the need for adequate supervision of children's homes is now recognised. The general public, and indeed many of our own profession, have not realised, however, that this need applies to institutions caring for *sick* children just as much as to institutions caring for unwanted children. Bad accommodation and inadequate nursing facilities, resulting in frequent cross-infection, are to be found just as often in children's hospitals, children's wards in general or cottage hospitals, and nursing-homes, as in orphanages.

It is more than a hundred years since Parliament first appointed the Commissioners in Lunacy, charged with ensuring that any institution which professes to treat mental cases—whether it be a rate-aided mental hospital or a private mental home—shall maintain at least a minimum standard of care. The case of the infant or young child is very similar to that of the mental patient inasmuch as they are equally inarticulate and have little effective say in arrangements made on their behalf. I suggest therefore that Parliament should make no less provision for safeguarding the interests of the young child than have been made for the insane person and the mental defective. We as a profession should make every effort to secure the establishment of a body which should:

(*a*) Lay down basic requirements for approved hospitals, or other places catering for infants and young children.
(*b*) Maintain a register of such institutions in which these requirements are fulfilled.
(*c*) Establish efficient supervision of these institutions so that up-to-date ideas on the welfare of the children shall be widely disseminated.

It is to be hoped that the committee which is to be formed by Parliament to inquire into orphanages will extend its deliberations to include all establishments where children are deprived temporarily or permanently of direct parental care.

London, S.W. GUY DAYNES.

BEDS FOR TUBERCULOUS PATIENTS

SIR,—Much has been said already about shortage of accommodation for tuberculous patients. The great difficulties in staffing adequately even the available beds, and the impossibility of increasing accommodation by allocating more beds for these cases, are well known, though the Ministry of Labour is doing as much as possible under wartime conditions to alleviate the situation. The danger of spread of infection by people who cannot find institutional accommodation has become a national problem.

In a previous letter (*Lancet*, 1943, i, 817) I suggested that a clear-cut classification of cases of pulmonary tuberculosis would help to economise the use of the beds available. I pointed out that advanced and chronic cases, unlikely to benefit from sanatorium treatment, needed hospital accommodation of a simpler kind. May I now draw your attention to an emergency measure which is working satisfactorily in Doncaster?

The public-assistance institution here, which not only serves the borough but also the rural district and the adjacent West Riding area round and near Doncaster, has set apart two small isolation wards for cases of advanced open tuberculosis, beyond the stage of sanatorium or surgical treatment. Thanks to the coöperation of the borough health authorities and the public-assistance board, I am, as clinical tuberculosis officer, in

control of these beds. The institution is run by the public-assistance board, but the cost of the beds is met by the tuberculosis authorities, either Doncaster or West Riding as the case may be. Thanks to this arrangement I have never had to admit hopeless chronic cases to our borough sanatorium, which is strictly reserved for pulmonary cases suitable for treatment. This, by the way, enables me to accommodate a fair proportion of West Riding cases, in addition to our borough cases, in the sanatorium, and thus alleviate somewhat the tense situation in the West Riding.

Overlapping between different departments, so often an obstacle in tackling this major problem of public health, can, as Doncaster has shown, be overcome by goodwill and understanding among the parties concerned.

Doncaster. E. G. W. HOFFSTAEDT.

PAYMENT OF PRACTITIONERS

SIR,—We suggest that in any revision of National Health Insurance the procedure for payment of civilian medical practitioners attending Service personnel sick on leave, by the submission of Army Form O.1667, would solve the problem of remuneration of the panel doctor. The forms he returned would show how much work he had done and he would be paid accordingly.

Persons above a certain salary (e.g., £500 a year), if included in the scheme, should pay an additional charge themselves. This would encourage them to respect their medical attendant and their times for summoning his aid. A visit dragged out to more than half an hour should count as two visits. Entirely free medical attention tends to be grossly abused by the upper classes, as may be confirmed by questioning any Service doctor who has to care for a large number of officers.

This system would raise all persons to the level of the "private patient" and would be simple to operate. Further, it would avoid the creation of a central controlling body for the medical profession, to which we are all, at this sick quarters, wholeheartedly opposed.

P. E. G. BURNETT, Squadron-Leader. JOAN MILLETT, Flight-Lieutenant.
A. A. HILL, Flight-Lieutenant. ELSPETH MCKECHNIE, Flying Officer.

*** The similar systems now on trial in New Zealand are discussed in a leading article.—ED. L.

QUININE AND MEPACRINE IN MALARIA

SIR,—Recent correspondence in medical journals has referred to the giving of quinine by intramuscular injection. The principal objection to this method has been pain. However in an ill man with failing peripheral circulation the problem of rate of absorption must also arise.

In the past twelve months at a general hospital we have treated over 5000 cases of malaria: during the height of the season last year it was a daily experience to admit unconscious or semiconscious men with malignant tertian infection. The invariable practice has been to give quinine by intravenous injection, and the results are among the most dramatic and satisfying that fall to the lot of the physician. It is a life-saving measure. We have given scores of such injections without mishap and this has been the general experience of hospitals in the MEF and CMF. The method is simple, safe, certain and painless.

The injection (gr. 10) rarely has to be repeated more than once and very rarely more than twice; after that the drugs can be given by mouth. If an intravenous drip has to be put up a second dose can of course be added to that. In Service personnel veins can always be found. The quinine should be well diluted (to 20 c.cm., or more if practicable) and given extremely slowly, at least 5 minutes being taken over the injection. In an emergency, if no sterile diluting fluid is available, the plunger of the syringe should be drawn back, after inserting the needle into the vein, so that the quinine is diluted with the patient's blood, and the injection should then be made very slowly as usual.

A letter is not the place in which to discuss the treatment of malaria; but another useful fact which should be widely known is that a large single dose of mepacrine can be given when rapid absorption is important. In malignant tertian infection, in some parts of the world It least, quinine by mouth is less effective than mepacrine. at has been our practice to give the daily amount of mepacrine (0·6 g. and in the last few months 0·8 g.) to all patients in one dose anyway. This is partly for administrative reasons and partly because it seemed to work better. Mepacrine has been given in this way to over 2000 individuals, and in no instance has there been any upset. True idiosyncrasy to mepacrine is very rare and the patient is likely to be aware of it. Sensitisation to mepacrine taken prophylactically was reported from one part of the Mediterranean, but this was due to small doses being taken over a number of days and is a different matter.

CMF. R. W. D. TURNER.

FEES FOR CIVILIAN MEDICAL ATTENDANCE ON MEMBERS OF THE FORCES

SIR,—In response to a request from a Parliamentary constituent of mine I asked the Prime Minister on Nov. 17 if his attention had been drawn to the inadequate fees payable on behalf of members of the Forces for professional attendance by civilian doctors, and whether he would take action to remedy this position. The Prime Minister replied that the present scales were fixed by agreement with the British Medical Association and he could not agree that they are inadequate. I may explain that it is a Parliamentary convention that when a question concerns all three of the fighting services it must be addressed to the Prime Minister.

My correspondent, who holds the medical degree of London University, forwarded me a copy of the official document in which the charges payable by the Government are set out. For a "visit and medicine" at the doctor's surgery the fee is 3*s.*; for similar service involving a journey of under two miles during the day, 4*s.* 6*d.*; during the night, 6*s.* My correspondent cites two actual instances:

(1) "An airman comes to my surgery with acute otitis media. He is given, besides advice, sulphanilamide tablets and an ointment to protect the skin from the discharge." Fee 3*s.*
(2) "I travel a mile to see an ATS at home on leave. She has asthma; she is examined and is given an injection of adrenaline, a mixture and some tablets of ephedrine." Fee 4*s.* 6*d.*

The extravagant scale on which services other than medical are rewarded by the Government brings into glaring contrast the contemptuous attitude of our rulers to the medical profession.

House of Commons. E. GRAHAM-LITTLE.

HEARING AIDS

SIR,—As president of the Hearing Aid Manufacturers Association I would like to confirm the statement (*Lancet*, Nov. 4, p. 610) that a specification has been evolved by our technical committee for a British standard deaf-aid. This information has been passed to the Duke of Montrose, as chairman of the National Institute for the Deaf, as well as to the Electro-acoustic Committee of the Medical Research Council. It is necessary for a supply of special parts to be released by the Board of Trade before production can be commenced.

50, Wigmore St., London, W1. O. C. LEADBITTER.

VITAMIN K AS A PROPHYLACTIC

SIR,—I wish to supplement the data given in my paper of April 15 (p. 493) to answer some of the criticisms in your leader on p. 506. (It should be noted that the figures in the last column of my table II should be per thousand instead of per cent.)

Your first point concerns the fact that my material only includes the mortality from hæmorrhage and not the frequency of non-fatal hæmorrhages. The reason for this is that my material represents observations in the nine years 1934–43. During this time many different doctors were appointed to the women's clinic in Gothenburg and a different degree of attention must have been paid to hæmorrhages, especially the minor ones. Therefore, the published incidences of hæmorrhages cannot be assumed to give a homogeneous picture of the frequency of bleeding. However, the babies who have died during this period have been examined post mortem by the same prosector and with the same technique. Thus, there is a greater possibility of getting comparable results if they are based on mortality than on morbidity.

A precise record of hæmorrhages not leading to death would admittedly have been a valuable contribution to the question of the usefulness of vitamin K as a prophylactic, but the absence of such a record seems to me not to diminish the value of the mortality figures.

Your second remark is that I have not investigated the effect of obstetric factors such as instrumental labour. Naturally, this is a factor of importance and I therefore wish to give some complementary data. In the following table different obstetric factors during the control period and the vitamin period are registered.

INCIDENCE OF OBSTETRIC FACTORS POSSIBLY CONTRIBUTING TO THE FREQUENCY OF DEATH FROM HÆMORRHAGE IN THE NEWBORN (PER 1000 BIRTHS)

Obstetric factors	Control periods		Vitamin period
	1934–37	1937–40	1940–43
Forceps (high and low)* ..	24·9	27·9	40·5
Abnormal presentations † ..	56·9	61·9	73·8
Albuminuria and nephropathia gravidarum ..	70·8	104·1	95·1
Eclampsism and eclampsia ..	10·0	12·7	7·9
Placenta prævia and prem. separation of placenta ..	6·1	8·0	5·1
Contracted pelvis	3·5	5·1	6·1
Hæmorrhagia in graviditate	..	6·6	7·5
Cæsarean section	3·5	3·9	4·1

* The maximum frequency of high forceps in these groups was 3%.
† Breech, transverse, brow and face presentations.

It will be seen that there is a certain increase instead of a decrease in the frequency of instrumental factors (forceps) and of abnormal presentations in the vitamin period. No significant change is seen in the frequency of the other obstetric factors investigated.

Thirdly, you discuss my inclusion of intracranial and some visceral bleedings in the conception of "hæmorrhagic disease of the newborn" and seem to be of the opinion that I should have adopted the view of many pædiatricians—that traumatic and asphyxial bleedings do not belong to this disease. If I had done so, the most interesting result of my paper—namely, the remarkable reduction in deaths from intracerebral bleeding during the vitamin period—would not have been observed. As pointed out above, this cannot be explained by a lower incidence of obstetric factors in the vitamin period. A beneficial effect of vitamin K seems to me to be the most probable explanation of this phenomenon. Further, the work of Rydberg (*Acta path. microbiol. scand.* 1932, suppl. 10) indicates a high frequency of injury to the intracranial vessels in the newborn. In view of the fact that up to 42% of all newborn babies during the first week of life for a shorter or longer time show a prothrombin index below 20 (= 5% prothrombin) and thus are disposed to bleeding from hypoprothrombinæmia, it is not astonishing to find that prophylactic treatment with vitamin K led to a remarkable reduction in deaths just in the intracranial group of bleedings. Salomonsen (*Acta pædiat.* 1939, **22**, suppl. 1) stated that about 20% of all clinical cerebral hæmorrhages in the newborn are late and coincide with the physiological hypoprothrombinæmia of the newborn. He therefore concludes (p. 74) that "morbus hæmorrhagicus must in these cases be held responsible for the development of the cerebral hæmorrhage." Our greater understanding of the mechanism of these bleedings points to hypoprothrombinæmia plus a lesion of the vessels, traumatic or inflammatory (Salomonsen pp. 9 and 10). Concerning visceral bleedings, most of these are perhaps of asphyxial origin. However, I see no reason why a hypoprothrombinæmia should not be as dangerous a factor in asphyxial bleeding as in any other bleeding. Therefore, your suggestion that the intracranial and most of the visceral bleedings should be excluded from my material seems to me not justified.

"Hæmorrhagic disease of the newborn" has hitherto included many forms of bleedings with different ætiologies (hypoprothrombinæmia, thrombopenia, fibrinogenopenia, real ulcers, &c.). The determination of prothrombin and the effect of vitamin K have made it possible to distinguish the hypoprothrombinæmic group. Since this group seems to be responsible for the majority of bleedings in the newborn, Salomonsen has characterised his "morbus hæmorrhagicus neonatorum" by the subtitle "hypoprothrombinæmia neonatorum." As seen from my paper, I have followed his definition, and in consequence all those groups of bleedings in which a reduction in mortality was found after the administration of vitamin K have been considered as belonging to this disease.

Gothenburg, Sweden. JÖRGEN LEHMANN.

VENOUS SPASM PREVENTING BLOOD TRANSFUSION

SIR,—Dr. Humble and Dr. Belyavin in your issue of Oct. 21 indicate that the generalised peripheral venous spasm encountered during transfusion might be due to "a pathological central nervous reaction." A pathway for conduction of constrictor impulses to the peripheral veins has been demonstrated by Donegan (*J. Physiol.* 1921, **55**, 226), who showed that stimulation of the abdominal sympathetics caused contraction of the veins of the leg. His experiments extended previous observations that peripheral stimulation of the sciatic nerve effected contraction of the saphenous vein. Since the generalised spasm is consistent with the mechanism of the central vascular reflex, either a pathological reaction or a normal vasomotor response, it may be presumed that efferent impulses are conducted by the demonstrated sympathetic pathway. If this conclusion is valid, it may be possible to impede the constrictor impulses, in a manner similar to that used for relieving arterial spasm, by a sympathetic block. This would avoid the dangers which arise from a sudden cessation of the spasm when a transfusion is being given under pressure.

Salisbury, Wilts. A. MACHALE HARMAN.

TEMPORARY HOUSES AND THE FAMILY

IN his presidential address to the National Conference on Maternity and Child Welfare, held in London last week, Mr. Henry Willink, Minister of Health, said: "It has been suggested that a policy of building two-bedroomed bungalows is an attack on the birth-rate. The criticism is that since these bungalows are to have a life of ten years, then for ten years the families occupying them will be restricted to a two-bedroom size. With all respect I think this criticism is without foundation. The sole reason why the Government has decided upon a programme of temporary housing is that it is calculated that by using labour and materials which cannot be used for permanent housing, the number of new homes which can be built in the two vital and most difficult years after the defeat of Germany will be doubled. That is the sole reason for the temporary scheme. These houses are intended for young couples, in order to provide as many as possible of them with a separate home, as quickly as possible. Which offers better conditions for starting a family—a home of your own, however small—or lodgings or a home with mother-in-law? I have asked local authorities to make arrangements by which families which outgrow the bungalows may transfer to the permanent houses—of good standards and modern design—many of which will be going up simultaneously. Other young couples will take over the bungalows. May it not be that not one, but two or even three families may be started in a bungalow during its ten years' life?"

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—Brigadier George Macdonald, MD, DPH, has been appointed director of the Ross Institute of Tropical Hygiene.

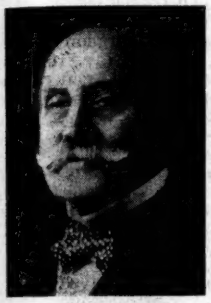
Dr. Macdonald, who was born in 1903, is the son of the late J. S. Macdonald, FRS, emeritus professor of physiology in the University of Liverpool. He was educated at King Edward VII School, Sheffield, Liverpool Institute and the University of Liverpool, where he graduated MB in 1924. He took his DTM & H the same year and became a research assistant at Sierra Leone (1925–29). Afterwards he worked on the research staff of the Malaria Survey of India (1929–31), was medical officer to the Mariani Medical Association, Assam (1932–37) and the CEPA malaria control scheme, Ceylon (1938), and was appointed assistant director of the Ross Institute in 1939. Dr. Macdonald will take up his new appointment on his release from the Services.

Obituary

JAMES DUNDAS-GRANT

KBE, M D EDIN., F R C S, F R C S E

WITH his friendly Scots voice, his store of learning, and his interest in everything and everybody, Sir James Dundas-Grant was one of the personalities of London medicine. Dying at 90, he had run and enjoyed his race, and he leaves his fellow laryngologists many an ingenious device and innovation by which to remember him.



Press Portrait Bureau

His father, who was an Edinburgh advocate, sent him to school first at the Edinburgh Academy and then at Dunkirk. When he had taken his MA at Edinburgh he went to Wurzburg University in Bavaria before becoming a student at St. Bartholomew's and other London hospitals. After qualifying in 1876 he held a house appointment at the Edinburgh Royal Maternity Hospital and then settled in general practice in London, where he joined the honorary staff of the Poplar Hospital and the Shadwell Lying-in Home. After a few years, however, he decided to be an aurist and laryngologist. Taking his Edinburgh fellowship in 1884, he abandoned general practice two years later and became FRCS in 1890. At the Central London Throat and Ear Hospital he was successively registrar, pathologist, and surgeon, which he remained until 1913, when he retired to the consulting staff under the age limit. His other principal appointments were to the Brompton Hospital, the West End Hospital for Nervous Diseases, the Freemasons' Hospital, and the Sussex Throat and Ear Hospital. Laryngeal tuberculosis and asthma were two of the subjects to which he paid close attention; but these were in fact so numerous that over a long period there is hardly a volume of *The Lancet* that does not contain fruits from his fertile mind. As a notable amateur of music, whose recreation of choice was to conduct an orchestra he had gathered together, he was well suited to be hon. surgeon to the Royal Academy of Music and the Royal Society of Musicians. His other recreation, fencing, found its professional equivalent in long association with the Volunteers, especially as surgeon-major to the Post Office Rifles. When war broke out in 1914 Dundas-Grant was already over 60, and his war work was done in London. But it was none the less active, and in 1920, when he was appointed a senior consultant to the Ministry of Pensions, he was created KBE.

He belonged to a great number of medical bodies, both at home and abroad. In London he was president of the Hunterian Society, the British Laryngological Association, and the laryngological and otological sections of the Royal Society of Medicine. Whether in the chair or out of it he was a valuable member of any society, being always ready with some relevant suggestion or recollection. Abroad he was rightly regarded as one of the leaders of his specialty and held honorary membership of societies in the United States, France, Germany, Belgium, and Hungary. His knowledge of languages helped him to play a useful part in promoting international medical comradeship.

Outside medicine he was vice-president, and at one time manager, of the Royal Institution, and as a Freemason he attained the rank of grand officer.

"Perhaps the most vivid recollection one has of Sir James Dundas-Grant," writes a former associate, "was his great knowledge of the literature of ear, nose and throat disease. Nothing seemed to escape his notice and he was always anxious to explore and try new methods in diagnosis and treatment. He was immensely interested in instruments and acquired a large collection. He himself contributed to this department of the specialty, and his laryngeal forceps for the removal of simple tumours of the vocal cord (now largely out of date owing to the development of direct laryngoscopy), his aural probe and his cold air-douche for labyrinth testing were among his inventions. Although he had been in retirement for some time his colleagues will miss his occasional appearances among them and his desire to lend a helping hand in times of emergency. His love for the Central London Throat, Nose and Ear Hospital (now amalgamated with Golden Square Hospital to form the Royal National Throat, Nose and Ear Hospital) was shown by the way he volunteered to serve not only in the last war but even in this one. He always took a keen interest in all the institutions with which he had been connected, and his loss will be sincerely felt by all."

Lady Dundas-Grant, a daughter of Edward Frith, died in May, and Sir James on Nov. 13. They leave two sons. A memorial service was held in the chapel at Brompton Hospital last Monday.

ERNEST VICTOR SUCKLING

M B LOND., D P H, F R I C

Dr. Suckling made a life study of water purification. In the last war, before he became a doctor, he was given a commission in the RAMC and placed in charge of a mobile laboratory engaged in examining and purifying water-supplies for our troops in France and Belgium. He studied medicine at the London Hospital and qualified in 1924. After a period as assistant in the clinical laboratory at the London he became assistant, and later partner, to Dr. J. F. Beale and Dr. J. C. Thresh, who had established themselves among the leading consultants on the purity of water. The death of Dr. Thresh and the retirement of Dr. Beale threw the whole weight of the practice on Suckling's shoulders. In the Croydon typhoid epidemic of 1937 he was called in to advise the corporation, and the influence of his recommendations is seen today in the precautions taken at waterworks. During the blitz on London his laboratory was wrecked and many of his papers lost, but despite many other calls on his time this did not prevent his compiling a fifth edition of the standard work, *Examination of Water and Water-supplies*, by Thresh, Beale and Suckling, in which he rewrote many chapters and brought the whole up to date. As one of few men who have specialised in this subject his place will be hard to fill. He died on Nov. 16, aged 51.

DAVID MICHAEL WINSER

M C, B M OXFD, LIEUTENANT RAMC

David Winser has been killed in Holland at the age of 29. To few men have the gods given more talent, and in a short life he used his gifts to the full. Son of Commander Winser, RN, he was born at Plymouth. As a scholar at Winchester he won prizes in classics and the King's gold medal for English verse, he rowed in the school IV and shot in the VIII. While in Canada as a cadet he set up a record for the Dominion Rifle Association by scoring a possible at all ranges.

He went to Oxford in 1933 as a scholar of Corpus Christi College, and spent four supremely happy years there, making a multitude of friends and reading Greats. He rowed in the university boat in 1935, 1936 and 1937, shot for the university, and won the Newdigate prize with a poem called "Rain" in 1936, the year he stroked the boat. He wrote two novels while an undergraduate. After rowing at Bad Emms against various German crews in 1936, he made an adventurous journey single-handed in a canoe down the Danube to Bucharest, and made his way to Salonika. From there on the Ægean he crossed the open sea in his canoe to Athens, which he was determined to explore. Largely as a result of a description of this trip he was given a Commonwealth Fund fellowship at Yale. It was then he began his medicine, reading some physiology and becoming interested in child psychology; and on getting back to England he went to St. Thomas's

Hospital as a student. After a few months there he gained a scholarship at Charing Cross Hospital, and he did the rest of his training there. He had supplemented his scholarship in America by odd jobs, so it did not seem strange to work as a night porter in the West End for a few months of his time at hospital, and he got immense fun out of receiving tips from his old Oxford friends who failed to recognise him in his uniform.

On the outbreak of war Winser volunteered at once as a pilot in the RAF, but found to his great disappointment that he was partly colour-blind. So he returned to Charing Cross, qualifying in May, 1943. While there he inquired into the effects of blitz conditions on the incidence of perforated peptic ulcer in London hospitals, and with D. N. Stewart published his findings in *The Lancet* of Feb. 28, 1942. Later they, with Dr. C. C. Spicer, added a sequel (*Lancet*, 1944, i, 14) which Winser summarised as showing that on hearing the sirens middle-aged men with peptic ulcers should take a glass of milk and retire to bed. There too he published two novels under the name of John Stuart Airey. *Night Work* was an account of the reactions of patients, nurses, students and staff in a big hospital during a severe air-raid. His last book, *There was No Yesterday*, describing an outbreak of typhoid in a small Welsh town, had a vivid charm which brought it wide popularity. He also found time, in spite of the labour of hospital work in air-raid periods, to edit the *Charing Cross Gazette* and write a large proportion of the unsigned articles himself. He began during his house-appointments to contribute to *In England Now*, and continued to write for our columns intermittently until a few weeks ago.

While his friends and contemporaries were fighting at sea, in the air and in the Middle East, Winser as a medical student was continually chafing against what he felt to be a life too safe and settled. After six months as house-physician at his own hospital he joined the RAMC, and volunteered for service with a Royal Marines commando. To his great joy his beloved green berets formed part of the first assault troops on D-day. With them he landed in Normandy, and with them he worked throughout the desperate fighting on the British left flank in June and July. For his gallantry and devotion to duty he received the Military Cross in the field. Next came a short spell in hospital—"I tried to smoke out some bees with a phosphorus grenade," he wrote in his peripatetic column of Oct. 7, "and got too close." He spent a week's hilarious leave in Paris, rejoining his men just in time to take part in the landing on Walcheren Island. While looking after some wounded men he was killed instantly by machine-gun fire.

Winser had wit and charm and good looks above the average. He had an immense zest for living, and loved every minute of his full life. "He did the things the rest of us dream of doing." As scholar and author, poet, oarsman and doctor he had many successes, yet he was the most modest of men, and therein lay the secret of his charm. Writing recently as a peripatetic correspondent he said, "one likes offering things to men one has known for some time." Words could not express more modestly the devotion through which he came to die. "I believe," writes a friend, "that he would have few regrets."

JAMES CROCKET

MD EDIN., FRCPE, DPH

Dr. Crocket, who died at his home in Glasgow on Nov. 6, was a man of ability and character. He left school at 11 and was apprenticed to a business concern, becoming manager by the time he was 21. But he had already determined to be a medical missionary, and gave up his job to study at the universities of Glasgow and Edinburgh. He took his Edinburgh MB in 1909, afterwards going to China, to a mission station of the Church of Scotland at Ichang. His health, however, broke down and he had to come home. On his recovery he took his MD with honours, in 1913, and in the same year became medical superintendent to the Consumption Sanatoria of Scotland and the Colony of Mercy for Epileptics, Bridge of Weir—a post which he held for 15 years. His consultant services to the sanatorium, and to the Orphan Homes of Scotland, were retained until 1935. He became expert in tuberculosis, on which he contributed many papers to the medical press, and he lectured on the subject at Glasgow University. Strong-minded, full of common sense, and a hard worker, he read widely and visited clinics abroad. His enthusiasm roused his patients to fight for the recovery of health, and his insight taught him their difficulties.

He died at Glasgow at the age of 66. His wife survives him with two sons and two daughters, three of whom follow their father in the medical profession.

ROBERT ERNEST KELLY

KT, CB, MD LPOOL, B SC VICT., F R C S

Sir Robert Kelly, emeritus professor of surgery in the University of Liverpool and consulting surgeon to the Liverpool Royal Infirmary, who died on Nov. 16, was one of the ablest all-round surgeons of his generation and an outstanding figure in Liverpool medicine.

Born in 1879, the son of Robert Kelly of Liverpool, he was educated at the Liverpool Institute and the University, where he soon showed the quality of his mind by winning scholarships and medals in pathology, surgery and forensic medicine. He took his B Sc at the age of 20, and graduated MB at 22. Four years later he took his MD and FRCS. After house-appointments and a registrarship at the Royal Infirmary, the 1914 war found him at the height of his surgical powers—imperturbable and with a technique combining beauty with speed. He went out to the Middle East and became consulting surgeon to the British forces in Salonika, with the rank of colonel. His services in that theatre were recognised by the award of the CB and medaille d'honneur des épidémies. After the war Kelly served on the Army Council's medical advisory board. He became a member of council of the Royal College of Surgeons in 1928, gave the Bradshaw lecture in 1938, and attained the dignity of vice-president of the College. He also represented his university on the General Medical Council. In the later years of his hospital and university work innumerable committee duties exacted far more of his time and energy than was fair to expect of a man already fully occupied with the calls of patients and doctors. His faithful attendance at these meetings, often tedious and not necessarily of first importance, was impressive.

He was an interesting speaker, with a gift for homely and illuminating illustration which brought him success both as a teacher and in the meetings of the Liverpool Medical Institution, of which he was twice president, an honour unique in its modern history. The same regard for the man and his work made him the natural choice for president at the annual meeting of the BMA in Liverpool in 1937. To his hospital colleagues, of his own age or of the younger generation, his enthusiasm and endless perseverance were an inspiration, and it was those who knew him best who spoke most highly of him. To the profession outside this inner circle it was his willingness at all times to place his skill and judgment at their service which made the greatest appeal. In university counsels he carried weight as a wise mentor and far-sighted guide. Though his profession was always his main interest he found time to be an ardent musician, a keen golfer, and something of a pioneer in colour photography. His nature was permeated by a kindliness which disarmed criticism; it harboured neither jealousy nor meanness of spirit. He was an optimist, but his optimism was tempered with sound common sense. His many qualities and services were recognised in 1939 when he was knighted.

"As a student," writes R. C., "I was one of Kelly's dressers, and later I became one of his colleagues. My main impressions of him are his generosity, his humility and his likeableness. Becoming one of the 'great ones' did not alter his natural geniality and courtesy. He gave you the feeling that he enjoyed talking with you, whether it was about some clinical problem, or whether it was the sharing of one of his interests or enthusiasms. Although he did not write much, and did not consciously try to gather a school of younger men around him, his

wide influence will long continue. To large numbers of men who passed through his hands as students and house-surgeons he was 'a father of his people.' They could not help but gather from him high standards of surgery, of craftsmanship, of thoughtfulness, of readiness to learn from experience."

He married Averill Edith Irma, daughter of Dr. J. Edlington M'Dougall, and she survives him with one daughter.

DUNCAN MacCALLUM BLAIR

M B GLASG., D SC LOND., F R F P S

Professor Blair died suddenly at his home in the University of Glasgow on Nov. 10 after a short illness from which he was believed to be making a good recovery. He was a comparatively young man but had won a high reputation in anatomy.

Born in 1896, he was a son of Dr. Alexander Blair of Ashington, Northumberland, and Crinan, Argyll. He was educated at Woodside School, Glasgow, and Glasgow University, and after serving as a surgeon sub-lieutenant RNVR in 1915–17 he graduated MB with honours in 1919. As soon as he was qualified he joined the staff of the anatomy department at Glasgow. At first he was inclined towards a surgical career, but under Professor Bryce's stimulation he became fascinated by anatomical research, and decided to make anatomy his life work. In 1922 he was appointed lecturer in regional anatomy at Glasgow; in 1927, at the early age of 31, he became professor of anatomy in King's College, London; and in 1935 he succeeded his former chief, T. H. Bryce in the regius chair at Glasgow. While in London he was mainly responsible for the planning of the new Hambleden department at King's College; for a time he was dean of the medical faculty at King's, and from 1931 to 1935 he was John Hunter lecturer in applied anatomy at St. George's.

Blair was a distinguished student and gained among other awards the Asher-Asher gold medal and the Symington prize of the Anatomical Society. To anatomical science he made important contributions, the chief of which concern the conducting system of the heart, the diaphragm, the knee-joint, the submandibular salivary gland and the nerve-supply of capillaries in striate muscle. To the teaching of anatomy he contributed the section on arthrology in Cunningham's textbook. He was an attractive lecturer and had not only the faculty of impromptu illustration, but also the gift of making most things seem simple. Moreover, his active interest in general medicine brought vitality to his lectures, which wherever possible illustrated the application of his subject to clinical work. Many students will long remember his teaching, and many will recall his kindliness and understanding as an examiner, not only in London and Glasgow, but at Aberdeen, St. Andrews, Sheffield and Edinburgh. He had a profound affection for his fellow men, and also a strong sense of public duty. He gave valuable service on the board of management of the Royal Maternity Hospital, the Western and Victoria Infirmaries, and the Royal Mental Hospital; he was a prominent layman in the Free Church of Scotland, chairman of the Glasgow Youth Organisations Council, and vice-president of the Inter-University Fellowship of Evangelical Unions; and in 1942 he organised a Glasgow University Naval Division and became its first commanding officer.

HEALTH OF THE SUDAN.—The news value of the annual report of the Sudan Medical Service is reduced by the time-lag in its appearance, which in this instance is two years, but much of its information cannot be found anywhere else. The public health was on the whole satisfactory throughout 1942, despite adverse conditions due to the war; but relapsing fever became especially prevalent along the pilgrim routes in Darfar and Khordofan, particularly in the Gezira area of the Blue Nile Province. Heavy abnormal rains resulting in high Nile floods produced favourable conditions for mosquito breeding and consequently a high malarial incidence in Northern Sudan was encountered during the last half of the year. As in 1941 there are reports of that dangerous insect, *Anopheles gambiæ*, in the Wadi Halfa area in June. A considerable increase in bilharziasis—fortunately *B. hæmatobium* infection, which is relatively mild—was noted in 1942. A much more serious development is the evidence that *B. mansoni* is becoming endemic in the northern Gezira.

Notes and News

LCC MEDICINE IN 1943

Sir ALLEN DALEY, county medical officer of health and school medical officer, in an interim report[1] says that in 1943 the ebb of population from London almost ceased and a substantial return flow was evident. "There was little resort to shelters, but the blackout and consequent lack of adequate ventilation continued. The food situation, however, remained good." During the year 11 LCC hospitals were damaged by the enemy, and the total number of incidents in them, from the beginning of the war, rose to 476, with a total death-roll of 141 patients, 86 hospital staff and 12 ambulance staff.

The incidence of tuberculosis, as measured by notifications, is steadily rising, but the only epidemic disease that caused serious anxiety was influenza, which reached its highest mortality since 1937. The number of new cases of syphilis in women rose from 709 in 1940 to 1107 in 1943. Under Regulation 33B, 654 notifications of the source of venereal infection were received (34 men, 620 women) and in the case of 60 women named more than once the prescribed action was taken. Of the 37 who were found, 3 refused examination and were prosecuted.

Admissions to LCC hospitals continue to increase, and at times, owing to war damage, there was pressure on accommodation, especially for the chronic sick and for minor infectious diseases. At the end of the year patients in hospital numbered 53,222 (11,065 in general, 34,107 in mental, and 8050 in other special hospitals). Those in mental hospitals included 2975 EMS patients and 320 in a military mental unit. The population of mental hospitals and institutions for the mentally defective again declined slightly, but there was a disquieting increase in tuberculosis among them. Outpatient attendances numbered 1,251,701 compared with 1,105,659 in 1942. Confinements in the Council's general hospitals rose from 12,230 to 13,666.

The school medical service reports, compared with 1938, a lower incidence of verminous infestation, scabies, enlarged tonsils and adenoids, and otorrhœa. There was some evidence that the condition of children's teeth "is not quite so bad." An investigation by Lady Mellanby, D SC, showed that in a sample of school-children aged 5–6, the number "caries-free" (according to the standards used) was 22% compared with about 5% in 1929.

Sir Allen Daley's comparison of infant mortality in London and New York is annotated on p. 728.

ADVICE ON NURSING EDUCATION

A NEW advisory board has been set up by the Royal College of Nursing, under the chairmanship of Sir Cyril Norwood, to ensure that nursing education, including postgraduate training, benefits by advances in educational method. Miss E. E. P. MacManus, matron of Guy's, and Lord Horder are vice-chairmen, and the board includes educationists representing not only the medical and nursing professions but the schools and universities. Since the introduction of state registration in 1925, nursing education has developed in many directions. Post-certificate qualifications have been introduced for sister-tutors, midwives, health visitors, nurse administrators, ward sisters and industrial nurses. Since July, 1939, the schools have begun to prepare girls for the first part of the preliminary nursing examination. The entry of girls for nursing training before the war was between 12,000 and 15,000 annually, and this number has now increased. Every year between 6000 and 7000 qualify for the state register. It is to be hoped that the advisory committee will contribute its share to reducing the high wastage figure.

ON GROWING UP

IN three talks published in separate booklets[2] Dr. Griffith discusses the physical and emotional changes accompanying adolescence in both sexes. He explains to his young audience that whereas sex-feelings are perfectly healthy and natural the sex-impulse, so potent a force for good or evil, has like a spirited horse to be properly managed and controlled. His style throughout is marked by sympathy, clarity, candour and absence of sentimentality.

---

1. Interim Report for 1943. From P. S. King and Staples Ltd., 14, Great Smith Street, London, SW1. Post free 7d.
2. Facts in Development; Emotional Development; and Towards Maturity. Edward F. Griffith, MRCS. (Lewis. Pp. 36, pp. 32, pp. 30. 1s. 6d. each.)

"DR. PHILLIGO"

Mr. C. E. Vulliamy has a painless way of presenting recent history. *Dr. Philligo*[1] follows *The Montagu-Puffins* and *The Polderoy Papers* with vigour and grace. This journal, fictitious like the others, covers the authentic events of the years 1887 to 1902. A man of character, the doctor is in many ways in advance of his time and can be counted on to appraise sardonically any form of superstition, cant or ordinary silliness. Poor brother Harry's mixed theology, Kewkett's collection of buttons, and the phantom nun seen by the sensitive lady who lived near Upwash, all get biting notice. His shrewd common-sense cannot, of course, deliver him entirely from the practices of his day. Poor Dolly, his ward, is sacrificed for some 30-odd years to contemporary estimates of the needs and purposes of women; and though he is scientifically aware of her growing frustration he often reinforces it ("Dolly begs for a bicycle. Dear Dolly must wait for a while"), and resents her late erratic escape very much indeed. On political issues he is mainly just, though naturally with some imperialistic bias. His medicine is up to date; he read his *Lancet* regularly, and quotes some of our stranger passages. Informative as he is about the events of the day, his most memorable records are domestic: Joey, the monkey lamp-stand, his niece Sophia's images of saints (she ran away with a bohemian gentleman and was not forgiven), and the incursions of old Mr. Polderoy into his neighbour's journal are the sort of things that get into a reader's mind and hang about for years.

University of Cambridge

On Nov. 24 the degree of MB was conferred on A. B. MacGregor, G. W. Harris and I. R. S. Gordon.

Society of Apothecaries of London

Brigadier L. E. H. Whitby will deliver a lecture, on blood-transfusion in peace and war, at Apothecaries' Hall, Blackfriars Lane, Queen Victoria Street, London, EC4, on Tuesday, Dec. 19, at 2.30 PM.

Medical Society of London

On Monday, Dec. 11, at 5 PM, at 11, Chandos Street, W1, Dr. C. P. Pinckney will speak on vomiting in infancy, Mr. N. M. Matheson on diseases of the female urinary bladder, and Dr. C. G. Barnes on hypoglycæmia following gastrectomy.

Royal Society of Medicine

There will be a meeting of fellows at 4 PM on Tuesday, Dec. 5. On the same day, at 4.30 PM, at the section of orthopædics, Captain George Blum will speak on the use of placstics in bone surgery and Mr. Rainsford Mowlem on cancellous chip grafts for the restoration of bone defect. On Dec. 6, at 2.30 PM, the section of history of medicine is holding a joint meeting with the British Archæological Association, when Mr. Wilfrid Bonser, PH D, will read a paper on epidemics during the Anglo-Saxon period.

Sampling Foodstuffs

The Society of Public Analysts is to hold a joint meeting with the food group of the Society of Chemical Industry at 2.30 PM, on Wednesday, Dec. 6, at the Chemical Society's rooms, Burlington House, Piccadilly, London, W1, when J. King, FRIC, C. A. Mawson, PH D, and E. M. Widdowson, PH D, will speak on methods of sampling foodstuffs for analysis.

Anglo-Soviet Medical Council

The annual general meeting of the council will be held on Friday, Dec. 8, at 4.30 PM, at 1, Wimpole Street, London, W1. It is hoped that Professor Priorov, the Russian orthopædic surgeon, who, with Professor Kotov, has lately arrived in this country, will speak at the meeting.

Dr. ARTHUR DAVIES, director of the Devonport pathological laboratory, is to act as consultant to the Ministry of War Transport, on questions affecting seamen's health, while Dr. M. T. Morgan is seconded to UNRRA.

CORRIGENDUM: *Myxœdema and Psychosis.*—Prof. H. Zondek points out that a statement in his paper in *The Lancet* of Sept. 30 may be misinterpreted. It runs "In cases of melancholia I found during the melancholic phases more or less complete retention of sodium chloride (Zondek 1935)." It would be more correct to say "In a number of cases of melancholia (though not in all) I found," &c.

1. London: Michael Joseph. Pp. 248. 12s. 6d.

Infectious Disease in England and Wales

WEEK ENDED NOV. 18

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 2335; whooping-cough, 1410; diphtheria, 619; paratyphoid, 18; typhoid, 7; measles (excluding rubella), 6001; pneumonia (primary or influenzal), 626; puerperal pyrexia, 127; cerebrospinal fever, 45; poliomyelitis, 12; polio-encephalitis, 2; encephalitis lethargica, 2; dysentery, 217; ophthalmia neonatorum, 62. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns there were no deaths from enteric fever, 5 (0) from measles, 2 (0) from scarlet fever, 3 (1) from whooping-cough, 15 (0) from diphtheria, 55 (3) from diarrhœa and enteritis under two years, and 33 (1) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 6 deaths from influenza.

The number of stillbirths notified during the week was 228 (corresponding to a rate of 34 per thousand total births), including 18 in London.

Appointments

CRAIG, A. C., MB EDIN.: acting medical superintendent of the Royal National Sanatorium, Bournemouth.
GROSS, WILHELM, MD VIENNA: RSO, Scarborough Hospital.
LONG, MARY, MRCS, DRCOG: temp. asst. MOH for East Ham.
ROTHWELL, T. W., MB MANC.: examining factory surgeon for Coniston, Lancs.
SUTHERLAND, D. S. MD GLASG.: temp. medical superintendent, City Hospital for Infectious Diseases, Newcastle-on-Tyne.
TEMPLE, BARBARA, MB LOND., DMR: Harker Smith registrar in the department of radiotherapy, University College Hospital.
WATTS, W. P. T., MS DURH., FRCSE: medical referee for the county-court districts of Consett, Gateshead, Hexham, Morpeth, Blyth, Newcastle-on-Tyne, North Shields and South Shields (circuit No. 1).

Births, Marriages and Deaths

BIRTHS

BIRKETT.—On Nov. 21, at St. Albans, the wife of Dr. N. L. Birkett, RAFVR—a daughter.
BUCKLAND.—On Nov. 18, at Woking, the wife of Major F. E. Buckland, RAMC—a son.
KENNEDY.—On Nov. 20, in Edinburgh, the wife of Surgeon Lieutenant Hugh Kennedy, RNVR—a son.
MACLURE.—On Nov. 16, at Freetown, Sierra Leone, the wife of Dr. Hugh Maclure, Colonial Medical Service—a son.
NICHOLSON.—On June 20, at Hitchin, the wife of Squadron-Leader B. Clive Nicholson, MD, RAFVR—a son.
PAYNE.—On Nov. 20, at Windsor, the wife of Mr. R. Vaughan Payne, M CHIR, FRCS—a son.
SEYMOUR-PRICE.—On Nov. 23, in London, the wife of Major D. B. Seymour-Price, RAMC—a son.
TIBBITS.—On Nov. 22, the wife of Dr. Stephen Tibbits, of Warwick—a son.
WYNN-WILLIAMS.—On Nov. 24, in London, the wife of Mr. George Wynn-Williams, FRCS—a daughter.

MARRIAGES

BORG—CORBETT-THOMPSON.—On Nov. 16, in London, Charles Borg, captain RAMC, to Sheila Mary Corbett-Thompson.
PRIOR—BARTHOLOMEW.—On Nov. 10, at Epsom, Allen Percival Prior, major RAMC, to Dorothy Mary Bartholomew.
WILSON—PRICE.—On Nov. 21, at Rhyl, Kenneth Lennox Wilson, surgeon lieutenant RNVR, to Christine Doria Price.

DEATHS

ANDERSON.—On Nov. 19, John Binnie McKenzie Anderson, MB GLASG., FRFPS, of Lynedoch Street, Glasgow.
ARNOTT.—On Nov. 16, at Southall, Middlesex, Maurice James Arnott, MB DURH.
ARKWRIGHT.—On Nov. 22, Sir Joseph Arkwright, MD CAMB., FRCP, FRS, aged 80.
BRIGGS.—On Nov. 22, at Hoylake, Henry Briggs, MB EDIN., LL D LPOOL, FRCS, aged 88.
MURRAY.—On Nov. 19, at Worksop, Charles Graham Murray, MD EDIN., aged 75.
ORR-EWING.—On Nov. 17, at Oxford, Jean Orr-Ewing, BM OXFD.
SHERSTON-BAKER.—On Nov. 18, at Bournemouth, Sir Dodington Sherston-Baker, BT., MRCS, lieut.-colonel IMS retd.

Dr. A. G. SANDERS, who is to spend a year in China as medical adviser to the British Council, has reached Chungking.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.